Department of Geology and Geophysics

INFORMATION FOR GRADUATE STUDENTS HANDBOOK
The Survival Manual

2014 - 2015

School of Ocean and Earth Science and Technology
University of Hawaii
## CONTENTS

**Introduction** .................................................................................................................. 1

**Current Research Areas/Concentrations** ...................................................................... 2

**Research Facilities** ........................................................................................................ 4

**Graduate Faculty Members** ............................................................................................ 7

**Financial Assistance** ....................................................................................................... 9
  - Scholarships and Fellowships
  - Graduate Assistantship Positions

**Normal Undergraduate Preparation** ................................................................................. 12

**Master’s Programs** .......................................................................................................... 13

### Master’s Plan A
- **Course Requirements** .................................................................................................. 13
- **Preliminary Conference** .................................................................................................. 13
- **Appointment of Committee** ............................................................................................ 13
- **Approval of Thesis Topic** ................................................................................................ 14
- **Application for Graduation** .............................................................................................. 14
- **Schedule Thesis Defense** ............................................................................................... 14
- **Thesis Defense** ................................................................................................................ 15
- **Submit Written Thesis** .................................................................................................... 15
- **Exit Interview** ............................................................................................................... 15
- **Graduate Chair Certifies Degree Requirements** .............................................................. 15
- **Conferral of Degree** ........................................................................................................ 15
- **Semester Evaluations** ..................................................................................................... 15
- **Residence** ........................................................................................................................ 15
- **Annual Evaluations** ........................................................................................................ 16
- **Time Allowed** .................................................................................................................. 16
- **Funding** ............................................................................................................................. 16
- **Summary of Procedures** .................................................................................................. 16
- **MS (Plan A) Timetable and Sequence of Progress Report Forms** ............................... 17

### Master’s Plan B
- **Course Requirements** .................................................................................................. 18
- **Preliminary Conference** .................................................................................................. 18
- **Degree Committee** ......................................................................................................... 18
- **Research Proposal** .......................................................................................................... 18
- **Application for Graduation** .............................................................................................. 18
- **Research Defense** ............................................................................................................ 19
- **Exit Interview** ............................................................................................................... 19
- **Graduate Chair Certifies Degree Requirements** .............................................................. 19
- **Conferral of Degree** ........................................................................................................ 19
- **Semester Evaluations** ..................................................................................................... 19
- **Annual Evaluations** ........................................................................................................ 19
- **Time Allowed** .................................................................................................................. 19
- **Funding** ............................................................................................................................. 19
- **Summary of Procedures** .................................................................................................. 20
- **MS (Plan B) Timetable and Sequence of Progress Report Forms** ............................... 20
Professional Masters of Geoscience (MGeo) ................................................................. 21
Course requirements ...................................................................................................... 21
Preliminary Conference ................................................................................................. 21
Appointment of Committee .......................................................................................... 21
Approval of Work Project .............................................................................................. 21
Application for Graduation .......................................................................................... 22
Schedule Oral Presentation of Work Project ............................................................... 22
Oral Presentation Announcement .................................................................................. 22
Work Project Oral Presentation ...................................................................................... 22
Submit Written Project Report ...................................................................................... 22
Exit Interviews ............................................................................................................... 23
Graduate Chair Approval .............................................................................................. 23
Conference of Degree ................................................................................................... 23
Semester Evaluation / Graduate Student Committee Report ........................................ 23
Residence ...................................................................................................................... 23
Annual Evaluation ......................................................................................................... 23
Time Allowed ................................................................................................................ 23
Funding .......................................................................................................................... 23
Summary of Procedures ............................................................................................... 24
MGeo Timetable ............................................................................................................ 24

Doctoral Program .......................................................................................................... 25
Requirements for Coursework and Residence ............................................................... 25
Preliminary Conference ................................................................................................. 25
Qualifying Examination ................................................................................................. 25
Admission to Candidacy ................................................................................................. 26
Comprehensive Examination ....................................................................................... 26
Appointment of Doctoral Committee ........................................................................... 29
Approval of Dissertation Topic ..................................................................................... 29
Application for Degree ................................................................................................. 29
Schedule Dissertation Defense ..................................................................................... 29
Dissertation Defense ...................................................................................................... 30
Revision of Written Dissertation in Light of Committee’s Evaluation ......................... 30
Submission of Form III and Dissertation ..................................................................... 30
Exit Interview ................................................................................................................ 30
Graduate Chair Certifies Degree Requirements .......................................................... 30
Conferral of Degree ...................................................................................................... 30
Semester Evaluation ...................................................................................................... 30
Annual Evaluation ........................................................................................................ 30
Time Allowed ................................................................................................................ 31
Funding .......................................................................................................................... 31
MS en Route .................................................................................................................. 31
Summary of Procedures ............................................................................................... 31
PhD Timetables and Sequence of Progress Report Forms ........................................... 32

Area Requirements ...................................................................................................... 34
High-Pressure Geophysics and Geochemistry ............................................................. 34
Hydrogeology and Engineering Geology ....................................................................... 36
Marine Geology and Geophysics ................................................................................... 38
Planetary Geosciences .................................................................................................. 40
Geophysics .................................................................................................................... 42
Volcanology, Geochemistry, and Petrology ................................................................. 43

**Appendix** .................................................................................................................. 45
   Who’s Who .................................................................................................................. 45
   Credit Hours and Courses ......................................................................................... 46
   Equipment Sign-Out .................................................................................................. 46
   Reserving Rooms ...................................................................................................... 46
   Forms, Forms, Forms ............................................................................................... 46
   Calendar of Events .................................................................................................... 48
   Examples of Student Forms ...................................................................................... 50
INTRODUCTION

PURPOSE
This booklet explains departmental procedures and requirements in the Department of Geology and Geophysics of the School of Ocean and Earth Science and Technology (SOEST) at the University of Hawaii. General rules of the University’s Office of Graduate Education are stated in the University of Hawaii catalog and on the Office of Graduate Education’s website.

THE COMMUNITY AND UNIVERSITY
Perceived by many as the paradise of the Pacific, Hawaii abounds with experiences in multicultural living. Honolulu, the capital, is a modern, cosmopolitan, tropical metropolis with a population of approximately 377,000. The University of Hawaii was founded in 1907 as a land-grant institution and is now also a sea-grant and space-grant institution. The principal campus is located in Manoa Valley, about 5 kilometers from downtown Honolulu and 3 kilometers from Waikiki Beach. The Manoa campus has about 20,000-plus students.

SCHOOL OF OCEAN AND EARTH SCIENCE AND TECHNOLOGY
The School of Ocean and Earth Science and Technology was formed in 1988 and combines the departments of Geology and Geophysics, Oceanography, Meteorology, and Ocean Resources Engineering with several research institutes (Hawaii Institute of Geophysics and Planetology, Hawaii Institute of Marine Biology, and the Hawaii Natural Energy Institute) and research centers (Hawaii Undersea Research Laboratory, International Pacific Research Center, International Center for Climate and Society, and Joint Institute for Marine and Atmospheric Research) to promote and enhance educational and research opportunities in these fields.

THE DEPARTMENT OF GEOLOGY AND GEOPHYSICS
The department has a large faculty with diverse research interests; most faculty members teach regularly. Additional researchers in or associated with the department may advise and employ graduate students. The department offers programs of research and study leading to the MS and PhD degrees. Currently, the department offers graduate programs in six fields and has approximately 60 graduate students in residence.

EXPECTATIONS FOR CONDUCT IN THE DEPARTMENT
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/) as well as other school and university policies, and to complete the sign the Code of Student Conduct Affirmation Form when joining the Department. University Policy (http://www.hawaii.edu/offices/eeo/policies.php?policy=sexual_harassment) concerning sexual harassment includes information on discerning appropriate from inappropriate behavior and the procedure for submitting a complaint. Each new student should take the following on-line program to be familiar with this serious issue: http://training.newmedialearning.com/psh/uhawaii/index.htm
CURRENT RESEARCH AREAS/CONCENTRATIONS

GEOPHYSICS AND TECTONICS

The Geophysics and Tectonics program covers the disciplines of geophysics, geodynamics, seismology, tectonics, structural geology, and other applications of physics and mathematics to the study of the Earth and terrestrial planets. Topics include: the imaging and study of geological structures, such as tectonic plates, continental margins, and submarine volcanoes; the dynamics of Earth’s deep interior, including mantle convection, subduction, seafloor spreading, and mantle plumes; rock mechanics, including the physics of cracks, dikes, faults, and crustal-scale deformation; and interactions at the air-rock and ocean-rock interfaces, including nearshore dynamics and sea level change. Students and faculty in the Geophysics and Tectonics division, nationally and internationally acknowledged leaders in their fields, seek to understand the complexity of geological systems using fieldwork and ship-based exploration, laboratory experiments, large-scale computing, mathematical and numerical modeling techniques, and global marine and terrestrial databases. These efforts help us to understand the inner workings of our planet and their interaction with Earth’s surface environment, and have broad governmental and commercial applications.

MARINE AND ENVIRONMENTAL GEOLOGY

This program provides students with a background that combines geology, geochemistry, geohydrology, biogeochemistry, and geobiology for technical and professional work in marine and environmental science at academic, industrial, and governmental institutions. It is also for students entering a career in resource exploration and management. The program provides courses and research opportunities in a wide range of fields, including sedimentology, stratigraphy, paleoceanography, carbonate sedimentology and reef structure, land-sea biogeochemistry and pollution, coastal hydrology and submarine groundwater discharge, numerical modeling of groundwater flow and contaminant transport, coastal geology, morphodynamics of shoreline change, sea level history of the Pacific, ecology, geobiology, microbiology, stable and radiogenic isotope geochemistry, origin and evolution of life on Earth and evaluation of possible habitats for Earth-like life on other planets. These diverse research efforts can involve several marine expeditions each year. Graduate students in the program are encouraged to participate in these voyages as part of their career training.

PLANETOLOGY AND REMOTE SENSING

Instruction and research in this program are focused on the study of the surfaces and interiors of planetary bodies in order to understand their origin and evolution. Such studies apply principles of geomorphology, geophysics, mineralogy, petrology, and geochemistry to the analysis of remotely acquired planetary data, meteorites, and laboratory and field analogues. The program also studies Earth in the context of other planets, and seeks to develop and utilize remote-sensing techniques and instruments for application to planetary and terrestrial (including submarine) science. Several faculty members are actively involved in NASA spacecraft missions studying terrestrial and outer planet (and planetary satellite) locations. Students from a wide range of backgrounds, including geology, astronomy, and engineering, focus their studies in one or more of the following areas: a) application of geological techniques using laboratory studies of planetary materials (meteorites and returned lunar samples) to understand the origin and evolution of planets, b) studies of the Earth in the context of comparative planetology, and/or c) the utilization of remote sensing data and the development of remote sensing techniques and instruments for planetary and terrestrial (including submarine and volcanological) science.
VOLCANOLOGY, GEOCHEMISTRY AND PETROLOGY

The University of Hawaii is well placed to study volcanoes. The Hawaiian Islands are volcanic and include Mauna Loa, the world’s largest volcano, and Kilauea, one of the world’s most prodigious lava producers. Other Hawaiian volcanoes are deeply dissected by erosion, providing access to stratigraphic sequences suitable for studies of volcanic evolution. The Pacific Ocean contains a great number of volcanic islands, the Galápagos, Tahiti, Samoa, and Marianas among them, but also conceals an immense number of submerged volcanoes. Hawaii’s geographic position makes the volcanoes of Alaska, the Cascades, Mexico, Central America, the Philippines, and Japan, as well as the submarine rifts of the East Pacific Rise and western Pacific back-arc basins, relatively accessible. This program’s studies are varied in nature: the petrology and geochemistry of basalts and their fractionation products in Hawaii and at other mid-plate volcanoes, mid-ocean ridges, volcanic arcs, and the back-arc basins; the chemical and isotopic variability of mantle and crustal magma sources; the mechanisms of explosive eruptions that generate silicic ash-flow tuffs (ignimbrites); lava flow morphology; the hazards arising from volcanic eruptions; the origin and emplacement mechanisms of oceanic and continental flood basalts; the nature and dynamics of magmatic plumbing systems; and the characteristics and products of underwater volcanism.
RESEARCH FACILITIES

GENERAL

Departmental faculty normally conduct research projects within the department in conjunction with one or more of its six research areas. In addition, the research institutes within SOEST and also the Water Resources Research Center have goals aimed at applied research, and can be sources of funding and guidance for graduate students. The University’s Space Grant and Sea Grant programs, International Pacific Research Center (IPRC), and the Pelagic Fisheries Research Program (PFRP) are also part of SOEST.

Computing

The Department of Geology and Geophysics is committed to ensuring that graduate students have adequate and modern computing facilities to fulfill their needs. Students have 24-hour access to more than 25 PC workstations in a dedicated computer room. All have ample disk storage capacity, large monitors, accelerated graphics capability, and multimedia hardware/software. All are networked and have open access to the Internet and a number of free-use peripherals such as postscript laser printers and digital scanners. Poster-size, high-quality, color printing is available to graduate students through their advisors. In addition, SOEST researchers maintain computing facilities in their own laboratories, which are made available to their students to support computing-intensive research.

Summary of Computing Equipment

Department computer rooms with 24 networked PCs
IP and wireless internet connection throughout SOEST
Numerous research workstations (Linux, PC, and Macintosh) maintained by individual faculty members
Geophysics and Tectonics Computational Facility, with 8 Linux workstations and 60-processor Linux cluster, 70 GB RAM and 5 TB RAID storage
Seismic reflection processing and interpretation software, including:
  Landmark Graphics ProMAX seismic processing software
  Landmark SeisWorks interpretation software
  Paradigm VoxelGeo interpretation software
  Paradigm GeoDepth depth migration software
Access to the Maui High Performance Computing Center

Analytical and Experimental Laboratories

Radiogenic Isotope Facility, including:
Nu Plasma HR multi-collector inductively coupled plasma mass spectrometer (MC-ICPMS)
VG54-WARP multi-collector high-abundance-sensitivity thermal ionization mass spectrometer (TIMS) for positive and negative ions analysis
VG Sector multi-collector thermal ionization mass spectrometer (TIMS) for positive ion analysis
Finnigan Element II inductively coupled plasma – mass spectrometer (ICP-MS)
Six high-resolution detector alpha spectrometry system (Canberra)
Class 1000 clean laboratory
Radioactive-isotope tracer and dating facilities

Experimental Petrology Laboratory, including:
A water-medium pressure line with seven 1100 °C split furnaces for study of dacites and rhyolites
An argon-medium pressure line with two 1600 °C vertical Deltech furnaces for study of andesites and basalts
Automated 0-60,000 psi pressure variator for the water line by Harwood Engineering
One rapid-quench cold-seal TZM vessel assembly and one conventional-quench TZM assembly
A third 1600 °C Deltech furnace configured as a 1-atm gas mixing furnace
Olympus BX-51 Pol microscope with Olympus C5050 Zoom digital camera and color TV
Buehler Isomet 1000 high-speed saw, Buehler Metaserv 2000 grinder-polisher, and Buehler Vibromet 2 vibratory polisher
Large volume Thermolyne muffle furnace (1200 °C)
Carver Mini-C 12 ton press
Oxy-acetylene welding rig and TIG welder

Light Isotope Facility, including:
Dedicated GC-combustion interfaces
Delta Plus and Delta Plus XP light stable isotope gas ratio mass spectrometers each interfaced with a dedicated Elemental Analyzer
Delta V Plus light stable isotope gas ratio mass spectrometers with GC-combustion interface and a GasBench automated gas-sampling interface
Delta V Advantage light stable isotope gas ratio mass spectrometer with GC-, LC- and TC-EA interfaces
VG Isoprime with a GC-combustion and Elemental Analyzer interfaces
Picarro wavelength-scanned cavity ring-down instrument for water isotope analysis

Visible to mid-infrared spectrometers, including:
Nicolet 470 FTIR spectrometer equipped for hemispherical reflectance and emission analyses
ASD portable field spectrometer (visible to near IR)
D&P portable field spectrometer (thermal infrared)

Other:
Cameca SX-50 electron microprobe with 5 wavelength-dispersive spectrometers, Kevex EDS system
Siemens SRS-303 automated X-ray fluorescence spectrometer (XRF)
JEOL LV-5900 scanning electron microscope (SEM) with Link EDS system

Sedimentology, sedimentary geochemistry, paleontology, and paleomagnetics (including a 3-axis cryogenic magnetometer) laboratories
Hydrogeology laboratory, fluid mechanics laboratory, soil and rock mechanics testing laboratory
Instruments for measuring electrical conductivity on rocks or rock melts, thermal conductivity and thermal expansion, porosity and gas permeability
Thin section and rock preparation labs
Crystal cutting and polishing facilities
PC-based image processing system

Seagoing Facilities Available to Faculty and Students within SOEST
The following research vessels and their supporting shipboard technical groups are available to researchers for gathering geophysical, geochemical, and other open-ocean and coastal data and samples.

R/V Kilo Moana
R/V Kila
R/V Ka’iminikai-o-Kanaloa (submersible and ROV mother ship)
Pisces V, research submersible with a depth capability of 2000m
RCV-150, a remotely-operated underwater vehicle (ROV)

Seagoing instrumentation includes equipment for digital seismic reflection, gravity, and magnetics measurements, coring, dredging, and water column studies, the HAWAII MR1 side-scan sonar system, and the fiber-optic-based deep-towed FOCUS camera system. In addition, software is available for multi-channel seismic processing and geophysical data analysis.

Other Facilities Available to Faculty and Students within SOEST

Engineering Support Facility, including:
Electronic, electrical, and mechanical engineering
Modern machine shop with CRC and HURCO mills
Electronics shop
Cameca IMS 1280 ion probe
Core and dredge collections
Geophysical data archives
Pacific Regional Planetary Data Center
SOEST research library
SOEST Publications Facility, including:
Staff for professional editing, illustration, drafting, design, and layout
Computer facilities for desktop publishing, including color publication
Two deep research wells and a shallow test well field
Geophysical well-logging system, evapotranspiration research station, and stream gauging station
High Pressure Facility, including:
Ultrahigh pressure and high pressure, high temperature diamond anvil cells with ruby fluorescence pressure calibration system
Computer-controlled energy-dispersive diffraction system
Large-volume (DIA-type) high pressure, high temperature apparatus
Position sensitive detector for high-pressure X-ray diffraction
Ultrasonic and acoustic equipment
Laue camera, Buerger precession camera, and Debye-Scherer cameras
Multi-channel micro-Raman, infrared and remote Raman spectrographs
Planetary environment simulators
Radioactive counting facility
X-ray diffraction, scanning electron microscope, scanning and transmission electron microscope

WATER RESOURCES RESEARCH CENTER
The faculty and staff of this center plan and conduct research related to Hawaii’s water resources, and provide training opportunities for engineers and scientists. Research is interdisciplinary with a broad base of physical sciences, ecology, technology, and social sciences. The center operates laboratories as well as field research facilities. The laboratories are housed in Holmes Hall (the engineering building), adjacent to the Pacific Ocean Science and Technology Building (POST).
At present, the major efforts of the center are directed toward research in hydrology and hydraulic engineering; the geology, geophysics, and geochemistry of water resources and waste disposal; sanitary engineering and public health; climatology; soil physics; agricultural engineering; forestry; and the social, economic, and legal aspects of water resources.

OTHER RESEARCH FACILITIES
Cooperative research is also carried out with other units of the University and federal laboratories in Hawaii. Some of these are the Institute for Astronomy, College of Tropical Agriculture and Human Resources, Pacific Biomedical Research Center, Hawaiian Volcano Observatory (USGS), Marine Fisheries Laboratory (NOAA), Pacific Tsunami Warning Center and Magnetic Observatory (NOAA), the International Pacific Research Center (IPRC), and Marine Bioproducts Engineering Center (MarBEC). Students are encouraged to take advantage of opportunities for cooperative, interdisciplinary research.
GRADUATE FACULTY MEMBERS

The graduate faculty of the university instruct graduate students and supervise their research. The degree committee of each graduate student is chosen from this body, and also includes an outside member. Current members of the graduate faculty in Geology and Geophysics and their research interests are listed below.

Garrett M. Apuzen-Ito, PhD, MIT (Woods Hole), 1996. Marine geophysics and geodynamics
Janet Becker, PhD, UCSD (Scripps), 1989. Geophysical fluid dynamics
Benjamin A. Brooks, PhD, Cornell, 2000. Tectonic geodesy, structural geology
Patricia A. Cooper, PhD, Hawaii, 1985. Seismology
Eric H. De Carlo, PhD, Hawaii, 1982. Marine geochemistry
Robert Dunn, PhD, Oregon, 1999. Marine geophysics and seismology
Aly El-Kadi, PhD, Cornell, 1983. Hydrology
Sarah A. Fagents, PhD, Lancaster (UK), 1994. Planetary volcanism, icy satellite geology
Charles H. Fletcher, PhD, Delaware, 1986. Near-shore processes, Quaternary geology
L. Neil Frazer, PhD, Princeton, 1978. Theoretical modeling and ecology
Patricia B. Fryer, PhD, Hawaii, 1981. Marine geology, petrology, tectonics
Michael Fuller, PhD, Cambridge, 1961. Paleomagnetism, geomagnetism
Eric Gaidos, PhD, MIT, 1996. Geobiology
Milton A. Garces, PhD, UCSD (Scripps), 1995. Infrasound, seismology, fluid dynamics
Michael O. Garcia, PhD, UCLA, 1976. Igneous petrology; volcanology
Jeffrey Gillis-Davis, PhD, Rice, 1993. Lunar geology, volcanology, crustal composition, remote sensing
Craig R. Glenn, PhD, Rhode Island, 1987. Sedimentary petrology and geochemistry, paleoceanography
Julia E. Hammer, PhD, Oregon, 1996. Volcanology, experimental petrology
B. Ray Hawke, PhD, Brown, 1978. Planetary geosciences
Emilio Herrero-Bervera, PhD, Hawaii, 1984. Paleomagnetism
Richard N. Hey, PhD, Princeton, 1975. Marine geophysics, plate tectonics
Bruce Houghton, PhD, Otago (New Zealand), 1977. Physical volcanology, volcanic hazards
Gary Huss, PhD, Minnesota, 1987. Ion microprobe analysis and cosmochemistry
Kevin T.M. Johnson, PhD, MIT (Woods Hole), 1990. Mantle petrology and geochemistry, marine geology
Barbara H. Keating, PhD, Texas (Dallas), 1976. Paleomagnetism
Klaus Keil, PhD, Johannes-Gutenberg (Germany), 1961. Meteorites
Alexander N. Krot, PhD, Moscow State (Russia), 1989. Cosmochemistry and meteorites
Paul G. Lucey, PhD, Hawaii, 1986. Planetary geosciences
John Mahoney, PhD, UCSD (Scripps), 1984. Geochemistry, radiogenic isotopes
Murli H. Manghnani, PhD, Montana State, 1962. Mineral physics
Fernando Martinez, PhD, Columbia, 1988. Extensional tectonics, marine geophysics
Floyd W. McCoy, PhD, Harvard, 1974. Marine geology, sedimentology, geochronology
Li-Chung Ming, PhD, Rochester, 1974. High-pressure mineralogy
Gregory F. Moore, PhD, Cornell, 1977. Seismic processing, tectonics
Peter J. Mougins-Mark, PhD, Lancaster (UK), 1977. Planetary geosciences, remote sensing
Katharina Pahnke, PhD, Cardiff (UK), 2004. Paleoceanography
Brian N. Popp, PhD, Illinois, 1986. Stable-isotope geochemistry
Douglas G. Pyle, PhD, Oregon State, 1994. Geochemistry, radioisotopes, marine geology
Greg Ravizza, PhD, Yale, 1991. Paleoceanography, marine chemistry, environmental geochemistry
Scott Rowland, PhD, Hawaii, 1987. Volcanological remote sensing
Kenneth H. Rubin, PhD, UCSD (Scripps), 1991. Geochemistry, marine geology
Kathleen Ruttenberg, Yale, 1989. Sedimentary geochemistry
Jane E. Schoonmaker, PhD, Northwestern, 1981. Marine geology and geochemistry
Edward R. Scott, PhD, Cambridge (UK), 1972. Meteorites
Sarah B. Sherman, PhD, Hawaii, 1998. Geochemistry, petrology
John M. Sinton, PhD, Otago (New Zealand), 1976. Igneous and metamorphic petrology
Brian Taylor, PhD, Columbia (LDEO), 1982. Geology of ocean-margin basins, tectonics
G. Jeffrey Taylor, PhD, Rice, 1970. Meteorites
Donald M. Thomas, PhD, Hawaii, 1977. Geochemistry of geothermal systems
Paul Wessel, PhD, Columbia, 1990. Marine geophysics
AFFILIATE GRADUATE FACULTY

F. Scott Anderson, PhD, Arizona State, 1998. Planetary geology and geophysics
Chuck Blay, PhD, Indiana, 1971. Sedimentology, Hawaiian geology
Rhett Butler, PhD, Caltech, 1979. Seismology
Rebecca Carey, PhD, Hawaii, 2008. Volcanology
John Dehn, PhD, Christian-Albrecht (Germany), 1992. Volcanology
Lucia Gurioli, PhD, University of Pisa, 2000. Volcanology
Victoria E. Hamilton, PhD, Arizona State, 1998. Planetary geosciences, IR spectroscopy, remote sensing
Andrew Harris, PhD, Open University (UK), 1996. Physical volcanology, remote sensing
Eddie Listanco, DSc, Tokyo, 1994. Geology
John Lockwood, PhD, Princeton, 1966. Volcanology
Delwyn Oki, PhD, Hawaii, 1996. Hydrology
Matthew Patrick, PhD, Hawaii, 2005. Volcanology
Aaron Pietruszka, PhD, Hawaii, 1998. Volcanology
Birger Schmitz, PhD, University of Stockholm, 1983. Mineralogy, petrology
Stephen Self, PhD, Imperial College, London (UK), 1974. Volcanology
Donald Swanson, PhD, Johns Hopkins, 1964. Volcanology
Carl Thornber, PhD, Colorado, 1992. Geochemistry, volcanology
Frank A. Truesdell, MS, Hawaii, 1991. Volcanology, igneous petrology
Dominique A.M. Weis, PhD, Université Libre de Bruxelles (Belgium), 1982. Geochemistry, volcanology
FINANCIAL ASSISTANCE
The department offers research and teaching assistantships, tuition waivers, and various scholarships and fellowships to qualified students. Each is described below.

Scholarships and Fellowships
The department offers various scholarships and fellowships, described in detail at www.soest.hawaii.edu/GG/gg_academics.html (under the “Financial Aid” link). These include:

Fred M. Bullard Endowed Graduate Fellowship: These awards are endowed by Thaïs F. Bullard for outstanding students with high potential for scholarship and research in the Dept. of Geology and Geophysics. Applications include research proposals submitted by graduate students (or faculty sponsor for incoming students) and are considered twice a year. The Fellowship is for one year with possible extension for a second year. Application deadlines are Januay 31 and August 31.

William T. Coulbourn Fellowship: These awards are endowed by the family and friends of former graduate student and professor William T. Coulbourn. They support marine geological research by graduate and undergraduate students. Application deadline is April 1.

Harold T. Stearns Fellowship: These awards, endowed by a former geologist in Hawaii, support research on certain geological and geophysical problems in Hawaii and the Pacific Basin. Funds are awarded on the basis of research proposals submitted by undergraduate and graduate students. Application deadline is April 1.

J. Watumull Merit Scholarship: This award is given each year to an outstanding Geology and Geophysics student by the Watumull Foundation. The recipient must have an excellent academic record and demonstrate outstanding service to the department or to fellow graduate students. Because the award is given in two parts, the recipient must have at least one more year of residence to be eligible.

Graduate Assistantship Positions (UHM “Graduate Assistant” website: http://manoa.hawaii.edu/grad/graduate-assistant)
A graduate assistantship (GA) is a half-time temporary appointment as either a Teaching Assistant (TA) or a Research Assistant (RA). The TA position is usually a nine-month appointment; the RA position is an eleven-month appointment. Regardless of appointment period, GAs are paid over the course of twelve months. The Department of Geology and Geophysics sometimes makes appointments for less than a full year (i.e., a semester). Salary for TAs is paid from 1 Aug to 31 January for the Fall semester and from 1 Jan to 30 June for the Spring semester.

Availability of Positions
The Department of Geology and Geophysics currently offers five TA positions each semester. The number of RA positions available each semester varies depending on the availability of funds by individual faculty members.

Duties
Teaching Assistants are required to teach undergraduate laboratories (normally two), under the direction of a faculty member in charge of the course. Research Assistants perform research duties that may or may not be related to their degree, working under the direction of a faculty member. Both TAs and RAs are expected to contribute an average of 20 hours per week to the assigned tasks, which do not necessarily overlap with the time required to conduct their own graduate research. Graduate Assistants with nine-month appointments (TAs) serve from one week prior to the start of fall semester through spring commencement and are entitled to three months off during the summer. Graduate Assistants with eleven-month appointments (RAs) are entitled to one month of duty-free time each year; this time should be scheduled at a time mutually agreeable to the student and faculty supervisor.
**GA Eligibility**

Students are required to maintain a 3.0 grade point average and must carry nine credit hours of degree-related coursework (excluding audit hours) each semester while holding the assistantship. However, students who wish to enroll for more than nine credit hours may sometimes do so with department approval (requiring a memo to the Graduate Fellowships Office from the department chair). According to University policy, non-native English speakers with any instructional responsibility must demonstrate proficiency in English; the minimum score required for the Test of English as a Foreign Language (TOEFL) is 600/100 (paper/Internet versions) with subtest scores of 25 for listening and 25 for speaking; or IELTS score of 7.0 or above for the overall band test results.

**Salaries**

GAs are paid according to a 14-step pay scale set by the Board of Regents, most recently modified July 1, 2008. All GAs must be appointed to this pay scale. However, when a grant does not contain sufficient funds to meet a pay increase, a GA may be reappointed “below-scale” as a GA-0. The current salaries at each step are available at www.hawaii.edu/graduate/ga/compensation.htm.

According to University policy, initial placement on the pay scale will reflect the student’s experience, ability, and assigned responsibility; advancement from step to step, after at least one year of satisfactory service, may be recommended by the department chair or principal investigator of a student’s research project, with the approval of the pertinent academic dean (from the Board of Regents policies web site). TAs within the department receive a step 12 salary. The GG department suggests the faculty follow a general guideline for RA salary levels starting at step 11R for incoming students (possibly 12R if the student already has an MS degree) and reaching a maximum of step 13 or 14, with increases following dates of significant progress toward degree completion (passing of departmental exams, etc.).

**Tuition Assistance Scholarships (Tuition Waivers)**

Both types of graduate assistantships (research and teaching) receive tuition assistance scholarships that are not exempt from University fees. University fees include the Board of Publications fee, the Student Health Fee, the Graduate Student Organization fee, etc. University fees are paid at the time the student registers for classes.

**Benefits**

Graduate Assistants who are appointed at half-time for at least three months may enroll in the State Health Fund Plan and are eligible to join the University of Hawai’i Federal Credit Union. More information about health benefits is available from floor and department secretaries, or from the SOEST Personnel Office. Graduate Assistants are not eligible to accumulate vacation or sick leave.

**Pay Dates**

Graduate Assistants receive their paychecks on the 5th and 20th of each month. When an RA or TA is initially hired, the first two weeks of pay is held by the University until the end of that student’s term. Additionally, there may be some delay in the processing of the hiring paperwork. Therefore, new Graduate Assistants do not receive their first paycheck until a full month (or rarely two) after they begin work. A good way to avoid unnecessary hardship is to check that your paperwork is in order with your unit secretary or the SOEST Personnel Office as early as possible.

**Continuation of Funding**

Both types of assistantships may be renewed based on satisfactory performance, availability, and number of GA slots available at the time. Although every attempt is made to provide funding, assistantships are not guaranteed for the duration of a student’s studies in the department. The department currently has a policy of giving incoming first-year graduate students priority for TA appointments. Ultimately, it is the responsibility of the graduate student to make sure funding continues. Sometimes, graduate students who are supported by an RA appointment take a TA position to gain valuable teaching experience and/or to extend their RA funds.

**Summer Overload Appointments**

These are additional half-time positions that are sometimes available to graduate students. They carry a stipend in addition to a concurrent RA or TA stipend. Normally, overload activity is permitted only during non-instructional periods (during the summer or between semesters). Stipends for summer overload appointments for RAs follow the same 14-step pay scale as that used for the stipends for the RA itself. Often, graduate students
are placed at the same step for their summer overload appointment as they are for their regular RA appointment; however, this is subject to the availability of funds.

**Paycheck Deductions for the PTS Deferred Compensation Plan**

The State of Hawai‘i uses the PTS Deferred Compensation Retirement Plan for part-time, temporary, and seasonal or casual employees, because these employees are not eligible to participate in the State Employees’ Retirement System. Graduate Assistants are exempt from this plan while they are full-time students, but are not exempt during non-instructional periods (over the summer). The employee’s contribution to the PTS Deferred Compensation Plan replaces his or her contribution to Social Security, although a Medicare contribution is still required. International students are exempt from this plan.

Graduate Assistants will be automatically enrolled in the PTS Deferred Compensation Plan for periods when they are not exempt. Each GA will be asked by the department to fill out an Enrollment Form. You will receive a copy of the booklet “PTS Deferred Compensation Retirement Plan Employee Information Booklet” from the department when you first enroll, which has answers to common questions you might have, and contact information.

**Tax Benefits Often Available to Graduate Students**

Graduate students in Hawai‘i are often eligible for tax credits. See the instructions published by the U. S. Internal Revenue Service and the State of Hawai‘i Department of Taxation.
NORMAL UNDERGRADUATE PREPARATION

Students are accepted from undergraduate majors in the natural sciences, mathematics, and engineering who have normally completed at least one year each of college calculus, geology, physics, and chemistry. Adequacy of each applicant's additional preparation will depend on the particular branch of geology and geophysics being pursued. At the time of application, the student should state the area in which he or she intends to study. The areas listed in the following sections are active areas of research in the department. A brief description and the normal undergraduate preparation for each are listed below. Students with backgrounds in other fields may be accepted in an area, but advancement to candidacy may be delayed. A complete statement of courses and other work necessary for the MS or to prepare for the PhD comprehensive examination is in a subsequent part of this handbook.

MARINE AND ENVIRONMENTAL GEOLOGY combine geological and geophysical studies to investigate the ocean basins and margins. Typically, a strong undergraduate major in geology or one of the other natural sciences, along with basic courses in physics, chemistry, and mathematics, would be sufficient for entrance. The student should be prepared to commence or continue course work in (1) structural or tectonic geology, (2) exploration geophysics, and (3) any one or more of sedimentology, paleontology, geochemistry, chemical oceanography, paleoceanography, remote sensing, or petrology, as applied to marine research.

PLANETOLOGY AND REMOTE SENSING are broad fields that use geological techniques to learn about the origin and evolution of the planets and solar system. Students are accepted from a wide range of backgrounds in geology and from outside the geosciences (e.g. astronomy, engineering). They are expected to have, or to develop, a broad basic knowledge of geology, geophysics, geochemistry, mineralogy, instrumentation, computer programming, and data-analysis techniques. Specific course requirements depend on the area of the student’s interest and are established upon consultation between the student, advisor and planetary geosciences faculty, with the approval of the Graduate Studies Committee when needed. Upon graduation, the student will be able to function in one of the classical fields of geology as well as in chosen specialties of planetary geosciences and/or remote sensing.

GEOPHYSICS AND TECTONICS uses the principles of physics to study the Earth. Areas of study include seismic wave propagation, earthquake source mechanisms, structure of the Earth, seismic exploration, heat flow, tectonic motion, lithospheric flexure, and mantle flow. Students may enter from majors in physics, geology, geophysics, mathematics, civil engineering, or geography. They should have an understanding of general physics and mechanics, and supporting mathematics. A background in geology (which can be acquired in graduate school) will be required before completion of graduate studies.

VOLCANOLOGY, GEOCHEMISTRY AND PETROLOGY combines geology with field and laboratory work on problems related to the origin and evolution of, and processes that modify, the Earth's mantle and crust, and the origins of igneous and metamorphic rocks, including studies of volcanic processes and hazards. In addition to basic courses in chemistry, physics, and mathematics, the student should ideally have had training in mineralogy and optical mineralogy, petrology, structural geology, and geological field methods.
MASTER’S PROGRAMS

Our department offers three tracks to a Masters degree. The M.S. Plan A program consists of coursework plus a research thesis; Plan A students typically publish their research results in the peer-review literature. The MS Plan B program requires significantly more coursework than Plan A, but does not require a research thesis. The Professional Master’s program, leading to the MGEO degree, emphasizes the application of geological sciences to problems in industry, education and policy, and it requires a work project.

For a complete listing of the requirements, please view the UH Manoa’s Office of Graduate Education website[1]. The Geology and Geophysics Department’s additions and modifications to the Office of Graduate Education policies and procedures are explained below.

Master’s Plan A: Research Thesis

Course Requirements (M.S. Plan A)

Students must take at least 30 credits overall from coursework and research. A maximum of 12 credits can come from research (GG 699 and GG 700); of these, six credits must be for GG 700. Credits for GG 700 can only accrue after a thesis proposal is approved.

At least 18 credits must come from courses taken for a letter grade (A, B, C, etc.) at the 300-level or above (excluding GG 699 and 700). At least 12 of the credits from courses must be from graduate courses (GG 600 – 798, excluding GG 699 and GG 700). All students must take GG 610, Graduate Seminar, once each year for two years or until graduation.

Specific departmental course requirements vary depending on the area of concentration (see Area Requirements). Requirements for students entering from fields other than geological sciences will be determined on an individual basis by the Graduate Studies Committee and the thesis committee. Directed Research (GG 699) may only be taken on a credit/no credit basis. If a student is receiving a research assistantship, teaching assistantship, or tuition waiver, then he or she must be registered for nine program-related credit hours during the semester in which he or she has the assistantship or waiver. Graduate Assistants registering for more than nine credits will require a memo of concurrence from the department chair.

Preliminary Conference (MS Plan A)

The purposes of the preliminary conference are to determine in which field the student will pursue a degree, to consider undergraduate deficiencies, to advise the student of a suitable selection of courses for the first semester, and to appoint an interim advisor in his or her field. Entering students will be advised by mail as to the time and place of the preliminary conference, which is normally conducted prior to registration for the first term. The department chair and the student’s interim advisor will be present; a representative(s) from the Graduate Admissions Committee (GAC) and/or Graduate Studies Committee (GSC) may also be present.

Undergraduate deficiencies will be assigned as follows. For all applicants, any of these courses not already completed will constitute a deficiency: one year each of college calculus, physics with labs, chemistry with labs, and geology-geophysics with labs. For applicants from majors that are equivalent to a BS (or BS in engineering) at the University of Hawaii at Manoa (UHM) any deficiency in a course required for the same BS (or BS in engineering) at UHM will be an undergraduate deficiency (e.g., a geologist entering without petrology, a physicist entering without electricity and magnetism). Normally, applicants from a field other than science, engineering, or mathematics would not be admitted. If circumstances suggest that such a student be admitted, all courses needed for a bachelor’s degree at UHM in the field he or she intends to enter will be listed as undergraduate deficiencies. Students shifting to a different field will not have the upper division courses (300–400) listed as undergraduate deficiencies (e.g., a geologist shifting to geophysics who has not had theoretical mechanics; a physicist shifting to geophysics who has not had structural geology).

Appointment of Committee (M.S. Plan A)

The student and his or her advisor will mutually agree on a thesis committee consisting of at least three members. The chair and a majority of the committee members must be of the graduate faculty of the Geology and Geophysics Department. If a committee chairperson wishes to nominate someone not in the graduate faculty he or she may nominate that person as a fourth member, the chair must first obtain approval from the department chair and then from the Office of Graduate Education.
Approval of Thesis Topic (M.S. Plan A)

A thesis proposal is required. The first purpose of the master’s thesis is to demonstrate that the student can master a research effort of moderate scope, and write and defend the results of his or her work in a logical and clear manner. The student is encouraged to discuss potential topics with the faculty as early as possible. A thesis prospectus or proposal is required. An acceptable thesis prospectus should be submitted to the thesis committee near the end of the student’s second semester. The prospectus should contain at least three pages of text and should include the topics listed below. Approval of the thesis topic is official when Office of Graduate Education Form II is filed.

Outline of Research Prospectus

1. TITLE
2. INTRODUCTION (Problem statement, rationale)
3. OBJECTIVES/HYPOTHESIS (Concisely written list)
4. APPROACH (Brief overview with references to established methods)

The student may not register for GG 700 (Thesis Research) until after the Office of Graduate Education accepts the department chair’s recommendation of the thesis topic. Registration in GG 700 must total 6 credit hours, including at least 1 credit hour in the semester or summer session in which the degree is awarded. Copies of the completed thesis must be submitted to committee members at least two weeks prior to the date of the final examination.

The department encourages theses to be organized so that they are ready for submittal (or have been submitted) for publication. Details that require material extraneous for publication but deemed necessary for the thesis, such as extensive reports of previous work and lengthy tables of data, should be set in chapters or appendices clearly independent of the principal work, discussion, and conclusions. The student should be aware of current Office of Graduate Education rules on co-authorship of publications. The current instructions for the preparation of the thesis are available in the Graduate Division office.

The second purpose of the thesis is to allow a student to develop an original scientific project under the tutelage of a faculty mentor, so as to add to the knowledge of the discipline and to establish the student as a qualified scientist in his or her own right. The research program typically involves the following: a study of the literature to establish a broad base of knowledge; making new measurements, or finding an intriguing and previously undiscovered method of understanding existing data; explaining the results; defending the thesis; and publishing.

It is especially important for students to gain direct, first-hand experience in creating their own database when this is practical and feasible. In any case, scientific integrity mandates that the student fully acknowledge in the thesis all collaboration; e.g., samples, sample preparation, measurements, analyses, data, or computer algorithms produced by others involved in the crafting of the thesis research.

Application for Graduation (M.S. Plan A)

Applications are available at the UH Manoa, Office of Graduate Education’s website. Deadlines are within the first month of each semester (including summer).

Schedule Thesis Defense (M.S. Plan A)

Office of Graduate Education rules stipulate that copies of the completed thesis must be submitted to committee members at least two weeks prior to the date of the final examination. Keep in mind, however, that this should be considered a minimum: outside members, or members who are away from the campus must be sent the thesis long enough in advance to accommodate mailing transit times. The policy of the Department of Geology and Geophysics is that a student should not be permitted to defend until his or her committee has agreed that the written thesis is defendable; i.e., that the thesis is likely to require only modest revisions in consequence of the oral defense.

Thesis Defense Announcement

Announcements should be posted at least one week prior to the date of the scheduled defense. The announcement must specify title, date, time, and place of defense. It also needs to include the student’s abstract. Students should provide the above information to the unit secretaries for electronic and paper posting as soon as possible.
**Thesis Defense (final examination for M.S. Plan A)**

The Geology and Geophysics Department normally prefers a final oral exam in which results are presented at a departmental seminar. At the option of the thesis chair, however, the final oral examination may be open only to members of the graduate faculty. In either case, reasonable notice must be given, and all members of the thesis committee must be present. If a committee member cannot be present at the defense, the student should consider re-scheduling the defense date; however, the student has the options of allowing a proxy member, or changing the committee entirely. At the defense, the candidate will present his or her work and principal results within a period of time (usually 30 to 40 minutes) agreed upon in advance by the thesis committee chair. Next, questioning by members of the audience is allowed. Then, the room may be cleared of persons not in the graduate faculty for additional questioning by the thesis committee, if members so wish.

After questioning is completed, the committee decides in private session whether or not the final examination was passed. Students failing the examination may repeat it only once. The committee also records its opinion as to whether or not the thesis is satisfactory. Modest rewriting may be needed, in which case signatures on the approval page of the thesis may be delayed.

If the student wants to continue his or her graduate work in this department, a final duty of the thesis committee is to recommend to the Graduate Studies Committee whether or not the student may be admitted to the PhD program.

**Submit Written Thesis (M.S. Plan A)**

The approved thesis and necessary copies are to be submitted to the Department of Geology and Geophysics office. Specific instructions are included with the application for graduation. All students in the Geology and Geophysics Department are required to submit a pdf file on CD and a printed copy of the thesis to the Geology and Geophysics Department office prior to graduation. The Graduate Division’s Student Progress Form IV will be submitted by the department when the thesis documents are in hand.

**Exit Interviews**

All graduate students in Geology and Geophysics are required to participate in an exit interview prior to graduation. The M.S. Student Progress Form IV will be signed by the department’s graduate chair only upon completion of the exit interview. Interviews will not be conducted by faculty members. These required interviews are conducted as part of the University of Hawaii’s accreditation with the Western Association of Schools and Colleges (WASC).

**Graduate Chair Approval (M.S. Plan A)**

The graduate chair submits the Certification of Degree Award, attesting that all degree requirements have been met.

**Conferral of Degree (M.S. Plan A)**

Degrees are conferred three times annually: December, May, and August.

**Semester Evaluations/Graduate Student Committee Report**

Department policy requires that a graduate student meet with the thesis/dissertation committee every semester to review progress and seek guidance. It is the student’s responsibility to organize this meeting and to complete the required form. In the rare case when a meeting of all committee members is not possible, a gathering of those who are available will occur, and the missing faculty member will be provided with a copy of the form. A form to document completion of the evaluation is available at: [www.soest.hawaii.edu/asp/GG/resources/official_forms.asp](http://www.soest.hawaii.edu/asp/GG/resources/official_forms.asp) under G&G Official Forms.

**Residence**

The minimum residence requirement by the Office of Graduate Education is two semesters of full-time work or four six-week summer sessions or the equivalent in credit hours applicable to the student’s degree program.

**Annual Evaluations**

The academic record of all students and the length of time taken to earn that record will be evaluated annually in mid-spring. This evaluation of progress will include a written statement of progress and problems from the student, and an interview of the student by members of the Graduate Studies Committee. The student’s advisor or committee chair, or his or her employer (if any), will not be present at the oral evaluation, although they will complete written evaluations. Members of the Graduate Studies Committee will review and evaluate the student’s plan of study and progress. All evaluators will report their opinions to the Graduate Studies Committee of how deserving of financial aid and office space each student is for the following year. Suggestions
from students for departmental improvements are strongly encouraged during the interview. The results of the spring evaluation become part of the student’s file.

**Time Allowed**

All work toward a master’s degree must be completed within seven years preceding the date upon which the degree is conferred. Credits earned prior to the seven-year period are not valid for the application toward the degree. Candidates who fail to complete all requirements in the specified time are automatically dropped from the program. Reinstatement for a limited period of time is only possible upon favorable recommendation of the field of study and concurrence of the Dean of Graduate Education.

**Funding**

The initial offer letter details the department’s commitment to funding. No funding is guaranteed beyond the initial offer. If additional funding is needed to complete the degree, this must be negotiated with the advisor and the department chair. Criteria for additional funding include the student’s progress toward completion of the degree, availability of support, and the nature of the problem that prevented the student from completing the degree as planned. Priority for awarding Teaching Assistantships is given to students within their first two years in the department.

**Summary of Procedures (M.S. Plan A)**

1. Preliminary conference; appointment of interim advisor. Commence Student Progress Form I.
2. Appointment of thesis committee. Commence Student Progress Form II.
3. Approval of thesis topic (Student Progress Form II).
5. Schedule thesis defense.
6. Defend thesis (Student Progress Form III).
7. Submit written thesis to the Graduate Records Office (Student Progress Form IV).
8. Submit pdf file on CD and a hard copy of written thesis to the Geology and Geophysics Department Office.
9. Exit interview.
10. Graduate chair certifies that all degree requirements have been met.
11. Conferral of degree.

**Deadlines for submission of degree applications, final examination and thesis deposit vary between the fall, spring, and summer semesters. Leona Anthony informs students of specific dates via e-mail.**

***NOTE: The Geology and Geophysics Department does not require a general examination.***

---

**MS PLAN A TIMETABLE AND SEQUENCE OF PROGRESS REPORT FORMS**

<table>
<thead>
<tr>
<th>FORM/TASK</th>
<th>EXPECTED PROGRESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>--------------------------------------------</td>
</tr>
<tr>
<td>I.</td>
<td>Preliminary Conference</td>
</tr>
<tr>
<td>I.</td>
<td>Admission to Candidacy</td>
</tr>
<tr>
<td>II.</td>
<td>Thesis Committee Selection</td>
</tr>
<tr>
<td>II.</td>
<td>Approval of Thesis Proposal</td>
</tr>
<tr>
<td>III</td>
<td>Final Exam (Thesis Defense)</td>
</tr>
<tr>
<td>IV.</td>
<td>Thesis Approval and exit interview</td>
</tr>
</tbody>
</table>

*GG Department Form*
Master’s Plan B (Coursework, Non-thesis)

Normally, students in Geology and Geophysics are admitted to Plan A in the MS program. If a demonstration of research ability is deemed unnecessary for the student’s intended career, the student may be admitted to Plan B. The department’s requirements for the Plan B master’s degree are as follows.

Course Requirements (M.S. Plan B)

At least 30 credit hours must be completed. A minimum of 18 credit hours must be earned in courses numbered 600-798 (excluding GG 700, which is not for Plan B students). A maximum of 6 research credits (GG 699) may be applied to the overall credit requirement.

Departmental course requirements vary depending on the area of concentration (see Area Requirements). Requirements for students entering from fields other than geological sciences will be determined on an individual basis by the Graduate Studies Committee and the thesis committee. Directed Research (GG 699) may only be taken on a credit/no credit basis. If a student is receiving a research assistantship, teaching assistantship, or tuition waiver, then he or she must be registered for nine program-related credit hours during the semester in which he or she has the assistantship or waiver. Graduate Assistants registering for more than nine credits will require a memo of concurrence from the department chair.

Preliminary Conference (M.S. Plan B)

The purposes of the preliminary conference are to determine in which field the student will pursue a degree, to consider undergraduate deficiencies, to advise the student of a suitable selection of courses for the first semester, and to appoint an interim advisor in his or her field. Entering students will be advised by mail as to the time and place of the preliminary conference, which is normally conducted prior to registration for the first term. The department chair and the student’s interim advisor will be present; a representative(s) from the Graduate Admissions Committee (GAC) and/or Graduate Studies Committee (GSC) may also be present.

Undergraduate deficiencies will be assigned as follows. For all applicants, any of these courses not already completed will constitute a deficiency: one year each of college calculus, physics with labs, chemistry with labs, and geology-geophysics with labs. For applicants from majors that are equivalent to a BS (or BS in engineering) at the University of Hawaii at Manoa (UHM), any deficiency in a course required for the same BS (or BS in engineering) at UHM will be an undergraduate deficiency (e.g., a geologist entering without petrology, a physicist entering without electricity and magnetism). Normally, applicants from a field other than science, engineering, or mathematics would not be admitted. If circumstances suggest that such a student be admitted, all courses needed for a bachelor’s degree at UHM in the field he or she intends to enter will be listed as undergraduate deficiencies. Students shifting to a different field will not have the upper division courses (300-400) listed as undergraduate deficiencies (e.g., a geologist shifting to geophysics who has not had theoretical mechanics; a physicist shifting to geophysics who has not had structural geology).

Degree Committee (M.S. Plan B)

A committee must be formed, composed of an advisor and two other Geology and Geophysics graduate faculty.

Research Proposal (M.S. Plan B)

In order to enter the Plan B program, a student must submit an acceptable proposal to his or her committee explaining the academic focus of the MS, outlining what courses he or she plans to take, and specifying the type of research activity in which he or she will participate. If the student is switching from the M.S. Plan A (research thesis) program to the M.S. Plan B (Non-Thesis) program, the Graduate Studies Committee must approve the Plan B proposal.

Application for Graduation (M.S. Plan B)

Deadlines are within the first month of each semester.
Research Defense (M.S. Plan B)
A written research report is required. The topic must be approved by the student's entire committee. The finished report must be delivered to the committee at least one week prior to the oral exam. An oral exam covering the student's research report and general geological knowledge is required. The student's entire committee must attend. Other faculty may attend, but only the student's committee votes. The oral exam can be repeated only once.

Exit Interviews
All graduate students in Geology and Geophysics are required to participate in an exit interview prior to graduation. The M.S. Student Progress Form III will be signed by the department's graduate chair only upon completion of the exit interview. Interviews will not be conducted by faculty members. These required interviews are conducted as part of the University of Hawaii's accreditation with the Western Association of Schools and Colleges (WASC).

Graduate Chair Approval (M.S. Plan B)
The graduate chair submits the Certification of Degree Award, attesting that all degree requirements have been met.

Conferral of Degree (M.S. Plan B)
Degrees are conferred three times annually: December, May, and August.

Semester Evaluations/Graduate Student Committee Report
Department policy requires that a graduate student meet with the thesis/dissertation committee every semester to review progress and seek guidance. It is the student's responsibility to organize this meeting and to complete the required form. In the rare case when a meeting of all committee members is not possible, a gathering of those who are available will occur, and the missing faculty member will be provided with a copy of the form. A form to document completion of the evaluation is available at: www.soest.hawaii.edu/asp/GGresources/official_forms.asp under G&G Official Forms.

Annual Evaluations
The academic record of all students and the length of time taken to earn that record will be evaluated annually in mid-spring. This evaluation will include a written statement of progress and problems from the student and an interview of the student by members of the Graduate Studies Committee. The student's advisor or committee chair, or his or her employer (if any) will not be present at the oral evaluation, although they will complete written evaluations. Members of the Graduate Studies Committee will review and evaluate the student's plan of study and progress. All evaluators will report their opinions to the GSC of how deserving of financial aid and office space each student is for the following year. Suggestions from students for departmental improvements are strongly encouraged during the interview. The results of the spring evaluation become part of the student's file.

Time Allowed
All work toward a master's degree must be completed within seven years preceding the date upon which the degree is conferred. Credits earned prior to the seven-year period are not valid for the application toward the degree. Candidates who fail to complete all requirements in the specified time are automatically dropped from the program. Reinstatement for a limited period of time is only possible upon favorable recommendation of the field of study and concurrence of the Dean of Graduate Education.

Funding
The initial offer letter details the department’s commitment to funding. No funding is guaranteed beyond the initial offer. If additional funding is needed to complete the degree, this must be negotiated with the advisor and the department chair. Criteria for additional funding include the student’s progress toward completion of the degree, availability of support, and the nature of the problem that prevented the student from completing the degree as planned. Priority for awarding Teaching Assistantships is given to students within their first two years in the department.
**Summary of Procedures (M.S. Plan B)**

1. Preliminary conference; appointment of interim advisor.
2. Appointment of program advisor and committee.
3. Approval of research proposal.
4. Application for degree.
5. Defense (final examination); judgment of Plan B paper.
6. Exit interview.
7. Graduate chair certifies that all degree requirements have been met.
8. Conferral of the degree.

**MS PLAN B TIMETABLE AND SEQUENCE OF PROGRESS REPORT FORMS**

<table>
<thead>
<tr>
<th>FORM/TASK</th>
<th>EXPECTED PROGRESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Preliminary Conference</td>
<td>1st semester (typically, before registration)</td>
</tr>
<tr>
<td>I. Admission to Candidacy</td>
<td>1st semester (at Preliminary Conference)</td>
</tr>
<tr>
<td>II. Degree Committee Selection</td>
<td>During 2nd semester</td>
</tr>
<tr>
<td>II. Approval of Research Proposal</td>
<td>During 2nd semester</td>
</tr>
<tr>
<td>III. Final Exam and exit interview</td>
<td>Within two years</td>
</tr>
</tbody>
</table>
Professional Master of Geoscience (MGeo)

Course Requirements (MGeo)

The MGeo requires a minimum of 30 credit hours at the 300 level and above. Of these, a total of 6 credit hours must be in GG750 MGeo Professional Project. Of the remaining 24 credits, a minimum of 12 credits must be in GG graduate courses (GG600-798, excluding GG750). Letter grades (A, B, C) must be taken in courses for at least 18 credits (excluding GG750 MGeo Professional Project). GG740 (MGeo Seminar, 1 credit hr) must be taken once a year. Up to 18 credits can be taken from the following undergraduate courses, provided they were not previously taken to fulfill the BS.

- Hawaiian Geology (GG402)
- Geological Data Analysis (GG413)
- Coastal Geology (GG420)
- Marine Geology (GG423)
- Environmental Geochemistry (GG425)
- Geophysical Methods (GG450)
- Hydrogeology (GG 455)
- Engineering Geology (GG454) [WI]
- Geological Remote Sensing (GG460)
- Geospatial Information (GG461)
- Fluid Mechanics (CEE 320)
- Geotechnical Engineering (CEE 355)
- Engineering Economics (CEE 405)
- Statistical Analysis for Business Decision (BUS 310)
- Engineering Management (ENGR 401)
- Engineering Economics (CEE 405)
- Environmental Impact Assessment (GEOG 412)
- Fundamentals of Soil Science (TPSS 304)

At least 3 credits in a writing class are required (per University of Hawai‘i at Mānoa policy, this writing requirement cannot be fulfilled by a course previously taken for another degree). Eligible classes include any GG course designated as writing intensive (W) as well as GG616, How to Write a Scientific Paper, ENG308, Technical Writing, and TPSS 657 Grant Writing for Graduate Students.

The coursework may be additionally tailored to meet the specific interests of the students by substituting courses other than those listed above, including courses in other departments, schools and colleges, subject to approval of the MGeo Faculty Oversight Committee and the MGeo Work Project committee.

Preliminary Conference (MGeo)

The purposes of the preliminary conference are to discuss the particular career path(s) the student is considering pursuing, to consider undergraduate deficiencies, to advise the student of a suitable selection of courses for the first semester, and to appoint a primary faculty advisor. Entering students will be advised by mail as to the time and place of the preliminary conference, which is normally conducted prior to registration for the first term. The department chair and the student’s advisor will be present; a representative(s) from the Graduate Admissions Committee (GAC) and/or Graduate Studies Committee (GSC) may also be present. MGeo Form I will be completed at the preliminary conference.

Appointment of Committee (MGeo)

The student and his/her primary academic advisor will mutually agree on an advisory committee for the MGeo work project. This committee will consist of the primary faculty advisor, one member of the MGeo Faculty Oversight Committee (not the primary faculty advisor), and the project mentor at the company or agency sponsoring the work project. Both faculty members on the committee must be on the graduate faculty of the Geology and Geophysics Department. The primary faculty advisor will chair the committee. If a committee chairperson wishes to nominate someone not in the graduate faculty, he/she may nominate that person as a fourth member prior to obtaining approval from the department chair and then from the Office of Graduate Education.

Approval of Work Project (MGeo)

The MGeo work project will be an applied geoscience activity that will provide professional experience for the betterment of the student’s future career pursuits. The project may be done as a volunteer, intern or employee with a private or public company, or a city, state, or government agency. The project may even be done with a faculty member of a college or university, but if so, the student is ineligible to be paid with a research assistantship. The main purpose of the MGeo work project is for the student to gain experience and expertise in an applied geoscience project from the start to completion. For working students, the project should not be an activity that would done as part of the regular employment activities, but should explore novel approaches or data sets for solving an important problem. An ideal project would take advantage of the research facilities and expertise of the faculty in GG to help develop new approaches for addressing geoscience problems encountered in industry or government agencies.

The second purpose of the MGeo project is for the student to develop proficiency in writing a professional document and to present it orally. Expertise in writing and speaking is essential for professional geoscientists,
and therefore the quality of the document and oral presentation should be at a professional level. The oral presentation can take place at the University of Hawai‘i or at the location of the sponsoring company or agency. In some cases, part or all of the oral presentation may be considered confidential, in which case the audience will be appropriately restricted according to the needs of the sponsoring organization.

A proposal or prospectus for the work project is required. The student is encouraged to discuss potential projects with his/her faculty advisor as early as possible. The project prospectus should contain at least three pages of text and should include the topics listed below. Approval of the project topic is official when Graduate Division Form II is filed.

Outline of Work Project Prospectus
1. TITLE
2. INTRODUCTION (Problem statement, rationale, previous work)
3. OBJECTIVES/SCOPE
4. APPROACH (Brief overview with references to established methods)

The student may register for GG 750 (MGeo Work Project) only after the department chair accepts the committee’s recommendation of the work project. Registration in GG 750 must total 6 credit hours, including at least 1 credit hour in the semester or summer session in which the degree is awarded. After the project is complete, the project report must be submitted to the project committee members at least two weeks prior to the date of the oral presentation. The report will be organized in the format of a thesis, specified by the UH Manoa Office of Graduate Education. The student should also be aware of current Office of Graduate Education rules on co-authorship of publications.

Application for Graduation

Students who plan to graduate must file a Graduate Application for Degree with the Office of Graduate Education Student Services, by the deadline specified in the UH Manoa Academic Calendar (typically within the first month of each semester, including summer). Forms and specific information is available at http://manoa.hawaii.edu/graduate/content/graduation.

Schedule Oral Presentation of Work Project

Office of Graduate Education rules stipulate that copies of the completed thesis must be submitted to committee members at least two weeks prior to the date of the final examination, which for MGeo students is the oral presentation. This should be considered a minimum, and the student should coordinate the date of submittal with each member of the committee. The policy of the Department of Geology and Geophysics is that a student should not be permitted to give the oral presentation until his/her committee has agreed that the written document is nearly acceptable, meaning it is likely to require only modest revisions in consequence of the oral defense.

Oral Presentation Announcement

Announcements of the oral presentation should be posted to the invited attendees (e.g., employees of the sponsoring organization only, the general public, or both as deemed appropriate by the sponsoring organization) at least one week prior to the date of the scheduled defense. The announcement must include an abstract of the project, and specify title, date, time, and place of the presentation.

Work Project Oral Presentation (final examination for MGeo)

All efforts must be made for all three members of the student’s work project committee attend the oral presentation. If a committee member cannot be physically present, the member may attend remotely using a two-way video/audio communication. In the extreme case when even remote attendance is impossible, the student has the options of allowing a proxy member to attend, or even replacing committee member(s). Again, the location and allowable attendees of the presentation will honor the requirements of the sponsoring organization.

At the presentation, the candidate will present his/her work and principal results within a period of time (usually 30 to 40 minutes) agreed upon in advance by the committee chair. After the presentation is complete, questioning by members of the audience is allowed. Then, the room may be cleared of persons not in the graduate faculty for additional questioning by the work project committee, if the project committee so wishes. After questioning is completed, the committee decides in a private session whether or not the final examination was passed. Students failing the examination may repeat it only once. The committee also records its opinion as to whether or not the written report is satisfactory. Modest rewriting may be needed, in which case signatures on the approval page of the report may be delayed.

Submit Written Project Report (MGeo)

The approved work project report and necessary copies are to be submitted to the Department of Geology and Geophysics office. Specific instructions are included with the application for graduation. All students in the
Geology and Geophysics Department are required to submit a pdf file and a printed copy of the work project document to the Geology and Geophysics Department office prior to graduation.

Exit Interviews
All graduate students in Geology and Geophysics are required to participate in an exit interview prior to graduation. The MGeo Student Progress Form IV will be signed by the department’s graduate chair only upon completion of the exit interview. Interviews will not be conducted by faculty members. These required interviews are conducted as part of the University of Hawaii’s accreditation with the Western Association of Schools and Colleges (WASC).

Graduate Chair Approval (MGeo)
The graduate chair submits the Certification of Degree Award, attesting that all degree requirements have been met.

Conferral of Degree (MGeo)
Degrees are conferred three times annually: December, May, and August.

Semester Evaluations/Graduate Student Committee Report
Department policy requires that a graduate student meet with the work project or thesis or dissertation committee every semester to review progress and seek guidance. It is the student’s responsibility to organize this meeting and to complete the required form. In the rare case when a meeting of all committee members is not possible, a gathering of those who are available will occur, and the missing faculty member will be provided with a copy of the form. A form to document completion of the evaluation is available at: http://www.soest.hawaii.edu/GG/resources/gg_resources.html under “Official Forms”.

Residence
The minimum residence requirement by the Office of Graduate Education is two semesters of full-time work or four six-week summer sessions or the equivalent in credit hours applicable to the student’s degree program.

Annual Evaluations
The academic record of all students and the length of time taken to earn that record will be evaluated annually in mid-spring. This evaluation of progress will include a written statement of progress and problems from the student, and an interview of the student by members of the Graduate Studies Committee. The student’s advisor or committee chair, or his or her employer (if any), will not be present at the oral evaluation, although they will complete written evaluations to the Graduate Studies Committee prior to the meeting. Members of the Graduate Studies Committee will review and evaluate the student’s plan of study and progress. Suggestions from students for departmental improvements during the interview are greatly appreciated. The results of the spring evaluation become part of the student’s file.

Time Allowed
All work toward a MGeo degree must be completed within seven years preceding the date upon which the degree is conferred. Credits earned prior to the seven-year period are not valid for the application toward the degree. Candidates who fail to complete all requirements in the specified time are automatically dropped from the program. Reinstatement for a limited period of time is only possible upon favorable recommendation by the Department Chair and concurrence of the Dean of the Graduate Division.

Funding
MGeo students are not eligible for Teaching Assistantships or Research Assistantships.

Summary of Procedures (MGeo)
1. Preliminary conference; appointment of interim advisor (completed Commence Student Progress Form I).
2. Appointment of work project committee (completed Commence Student Progress Form II).
3. Approval of work project topic and scope (completed Student Progress Form II).
4. Application for graduation, and payment of graduation fees. Deadlines are within the first month of each semester.
5. Schedule project oral presentation (completed final examination).
6. Oral presentation (completed Student Progress Form III).
7. Submit written project report to the GG Office (completed Student Progress Form IV).
9. Exit interview.
10. Graduate chair certifies that all degree requirements have been met.
11. Conferral of degree.

**Deadlines for submission of degree applications, final examination and project report deposit vary between the fall, spring, and summer semesters. Deadlines are located on the UHM Academic Calendar website.**

***NOTE: The Geology and Geophysics Department does not require a general examination.***

MGEO TIMETABLE (For a 2-year degree only) AND SEQUENCE OF PROGRESS FORMS

<table>
<thead>
<tr>
<th>FORM/TASK</th>
<th>EXPECTED PROGRESS FOR A 2-YR DEGREE</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Preliminary Conference</td>
<td>1st semester (typically, before registration)</td>
</tr>
<tr>
<td>I. Admission to Candidacy</td>
<td>1st semester (at Preliminary Conference)</td>
</tr>
<tr>
<td>II. Work Project Committee Selection</td>
<td>During 2nd semester</td>
</tr>
<tr>
<td>II. Approval of Work Project Prospectus</td>
<td>During 2nd semester</td>
</tr>
<tr>
<td>III. Final Examination (Oral Presentation)</td>
<td>End of second year</td>
</tr>
<tr>
<td>IV. Work Project Approval and exit interview</td>
<td>End of second year</td>
</tr>
</tbody>
</table>
DOCTORAL PROGRAM

The minimum requirement for the doctoral degree is three semesters of full-time work or its equivalent in credits at University of Hawaii at Manoa. Candidates must be registered in the GG 800 dissertation research course during the term in which the degree is awarded. Procedures for the doctoral program are laid out on the Office of Graduate Education website. A summary of these procedures is given below.

Requirements for Coursework and Residence (PhD)

All PhD students are required to have completed a program of coursework equivalent to that required for the Geology and Geophysics MS degree in their area of study. In addition, all students are required to take GG 610, Graduate Seminar, once each year for a maximum of five years. Students who obtain an MS degree en route to a PhD may apply their existing GG 610 class credits to meet the minimum requirements for a PhD. For those students entering with an MS degree, the coursework requirement normally will be waived if, during the period of their MS studies, they completed the required MS courses or acceptable equivalents. Beyond this and the list prepared at the preliminary conference, courses may be added or substituted by the advisor and doctoral committee.

Directed Research (GG 699) courses may only be taken on a credit/no credit basis. If a student is receiving a research assistantship, teaching assistantship, or tuition waiver, then he or she must be registered for nine program-related credit hours during the semester in which he or she has the assistantship or waiver. Graduate Assistants registering for more than nine credits will require a memo from the department chair.

The Graduate Division requires a minimum residence requirement of three semesters of full-time work while registered at the University of Hawaii at Manoa.

Preliminary Conference (PhD)

Students admitted to the program attend a preliminary conference with the department chair and representatives from the Graduate Admissions Committee and Graduate Studies Committee as discussed earlier for MS students. Any undergraduate deficiencies will be assessed. At the preliminary conference, a list of courses, if any, will be determined and assigned to the student with the purpose of helping to prepare the student for his or her intended research and comprehensive examination.

Qualifying Examination (PhD)

The purpose of the qualifying examination is to determine whether or not a student with a bachelor's degree meets the academic standards of the department for direct entry into the PhD program without completing an MS degree. For students entering with an MS degree and thesis in the sciences, the qualifying examination is waived. This examination is designed to evaluate the student’s ability to conduct research. The qualifying examination, normally held at the end of the student's first full year in the program (for students entering in the fall no later than the following September and for students entering in the spring no later than the following February), is required of all students entering with a bachelor’s degree who wish to be considered for the PhD rather than the MS program.

The examination will consist of a presentation intended to demonstrate the student’s ability to conduct PhD-level research. Two alternative types of presentation will be allowed: (1) results of an original research project (which may be an expansion of the student’s undergraduate honor’s thesis or other undergraduate research), or (2) a proposal for an original research project. Either (1) or (2) may lead on to the topic of the dissertation, but need not do so. The final product to be judged by the qualifying examination committee will consist of either:

Option 1: a written description of the research methods, procedures, results, bibliography, etc. of approximately 10-12 pages (a published paper for which the student is first author may substitute for the written description), or

Option 2: a written research proposal of similar length and similar in style to student proposals for aid from the Geological Society of America (see http://www.geosociety.org/).

In either case, there also will be an oral presentation of approximately one-half hour, to be followed by questions. A committee of at least three graduate faculty, including the student’s advisor (or interim advisor) and at least one member of the Graduate Studies Committee, evaluates the qualifying examination. If the student’s performance on the qualifying examination is judged by the committee to be acceptable for entry directly into the PhD program, the student will be admitted to PhD candidacy; if the performance is deemed unacceptable by the committee, the student will be required to complete the MS degree before receiving further consideration for entry into the PhD program.
Admission to Candidacy (PhD)

Following selection of a field of specialization and successful completion of the qualifying examination (where applicable), the student advances to candidacy. Admission to candidacy requires the approval of the graduate chair and Graduate Division. Form I is complete once this is granted.

GG PhD Comprehensive Exam Process (adopted April 3, 2009)

1. GENERAL
   a. The exam assesses the student’s reasoning abilities, and the depth and breadth of the student’s knowledge relevant to her or his field(s) of specialization and the geological sciences in general.
   b. Results form the basis for a decision as to whether or not the student has sufficient knowledge to undertake the independent research needed for a PhD project, and what, if any, additional work is needed.
   c. The exam is to be taken by the end of the fourth semester if entering without an MS.
   d. The exam is to be taken by the end of the second semester if entering with an MS.
   e. The exam consists of a written and an oral component; students are evaluated on the basis of overall performance on both.

2. SCOPE
   a. Exam topics include the student's field(s) of specialization and the geological sciences in general.
   b. The student and advisor, in consultation with the rest of the committee, will decide upon the intended field(s) of specialization. These fields should be as broad in scope as possible while maintaining a focus on the student's PhD research topic (for example, seismology, geochemistry, volcanology, but not reflection seismology, sedimentary isotope geochemistry, chemical volcanology).
   c. Based on the description of the field(s) of specialization, each committee member assigns the student a reading list consisting of review papers, research articles, or books so that the student may prepare in the areas in which he or she is to be tested.

3. COMMITTEE
   a. The Examination Committee consists of five members of the Regular or Cooperating GG Graduate Faculty, including the advisor. The advisor must submit Doctorate Student Progress Form 1A (“Proposal of Comprehensive Examination Committee”) to the GG Department Chair for approval of the committee’s composition. Any subsequent change in the committee also must be approved by the GG Department Chair.
   b. To supply breadth, two committee members must come from an outside specialty (there are four specialty areas: Geophysics and Tectonics; Marine and Environmental Geology; Volcanology, Geochemistry, Petrology; Planetology and Remote Sensing). If sufficient breadth cannot be provided by the Regular or Cooperating Graduate Faculty of GG, one UH Graduate Faculty member who is not on the GG Regular or Cooperating Graduate Faculty may serve as an outside member, pending the approval of the GG Department Chair. According to the UH Manoa, Office of Graduate Education (Feb. 2009), this member need not be a GG Affiliate Graduate Faculty member or affiliated in any other official capacity with GG.
   c. After approving the composition of the Examination Committee, the GG Department Chair will pick one of the members of the committee to serve as the Examination Chair. The student’s advisor cannot serve as the Examination Chair. The duties of the Examination Chair are to review the purpose of the examination, outline examination procedures, review the written questions, approve the details of the format (see sections 5a, g, h), indicate the order of questioning for the oral exam, and ensure that the examination is conducted impartially and in a manner consistent with the program’s procedures.
   d. The Examination Chair will hold a meeting of the Examination Committee to ensure breadth of coverage of questions in the appropriate fields of expertise and allied subjects. At this meeting, Doctorate Student
Progress Form 1B ("Timeline of Comprehensive Examination") will be filled in. The Examination Chair will subsequently obtain the signatures of the student and GG Department Chair on this form.

e. In cases where the GG Department Chair is also the student’s advisor, the GG Associate Chair must approve the committee, pick the Examination chair, and approve any subsequent changes to the committee.

f. The actions described in 3a-3e should all occur approximately four months before the examination.

4. PREPARATION

a. Soon after the meeting of the committee (see 3d), the student should meet with each member individually for advice on how to prepare for the examiner’s questions and to receive the list of recommended reading.

5. THE EXAM

a. The written component of the exam consists of two halves, both of which are closed book. It may be taken in one of two formats: in a single day (with a break for lunch) or on two consecutive days, depending on the choice the student has conveyed to the Examination Chair (see 5h). The student will be given four hours for each half, for a total duration of eight hours (or as recommended by KOKUA for students with documented writing disabilities). Upon completion of the written examination, the Examination Chair will distribute copies of all answers to all committee members.

b. One half of the written portion consists of questions aimed at examining broad knowledge in any aspect of the geological sciences. The other half of the written portion consists of questions aimed at the student’s field(s) of specialization. The student has the option of letting the Examination Chair know his or her choice of which half comes first (see 5h).

c. Each examiner will provide to the Examination Chair at least one question for each half of the written exam. Each examiner’s questions are to be answered by the student (although an examiner may give instructions to answer, for example, one of two questions, etc.). For each half of the written exam, an examiner should design questions that can be answered in a total of approximately 45 minutes (note that this will leave time for one or two short breaks). The questions in the half of the written exam that deals with the student’s field(s) of specialization will be based on the reading lists that the examiners have provided to the student.

d. Within one day of completion of the written exam, each examiner will provide to the Examination Chair written comments on particulars of the student’s answers to that examiner’s questions. Upon receipt of all the comments, the Examination Chair will give them to the student to aid the student in preparing for the oral exam. A copy of all the comments will also be provided to each of the examiners.

e. The oral exam follows the written portion within one week of the beginning of the written exam.

f. The oral exam should last no more than three hours. The Examination Chair will run the oral exam, for which all five members of the committee must be physically present.

g. Each member will ask questions of his or her choosing in the oral exam. Questions will be asked in a round-robin fashion, typically with a total of two rounds. Each committee member will have about 15 minutes for questioning in each round. The order of questioning may be determined either by the Examination Chair or by the student (at the student’s request to the Examination Chair at any time before the Examination Chair sets the final format; see 5h).

h. The one- vs. two-day format of the written exam, the choice of which half of the written exam is given first, and the order of questioning in the oral exam cannot be changed after they have been approved by the Examination Chair.

i. Upon completion of the oral exam, the student will leave the room. After discussion, each committee member will vote, by closed ballot, either Fail or Not Fail. If a majority of Fail votes are cast, a grade of Fail is assigned. Otherwise, a second discussion occurs, in which each member explains whether he or she thinks the student fell short and, if so, what the solution is. Then a second round of voting will take place, in which each member votes Pass or Conditional Pass, again by closed ballot. If four or five Pass votes are cast, a grade of Pass is given. Otherwise, a grade of Conditional Pass is assigned.
Students who fail and who wish to take the comprehensive examination a second time must do so within six months (see section 6).

6. EXAM OUTCOMES

The possible outcomes are:

**Pass:** Successful completion of the examination

**Conditional Pass:** The student demonstrated weaknesses that can be corrected by remedial work. The details of the remedial work must be stated clearly on Doctorate Student Progress Form 1C (“Results of Comprehensive Exam”), which must be completed within one day of the end of the exam. The committee members are responsible for evaluating the remedial work. If satisfactory, the student will receive a Pass. If unsatisfactory, a Fail grade will be assigned. The committee’s decision is recorded on Doctorate Student Progress Form 1D (“Results of Remedial Work Following Conditional Pass on Comprehensive Examination”). Remedial work is to be completed **within 6 weeks** of the examination unless it involves requiring the student to successfully complete, or serve as a T.A. in, an additional course. Should a course be required, it must be taken within one year of the exam.

**Fail:** The student does not demonstrate sufficient knowledge within the field(s) of specialization and/or in the geological sciences in general. On Doctorate Student Progress Form 1C, the committee will advise the student on how to acquire this knowledge. The student may take the comprehensive examination one more time **within six months**. Those who fail the second examination will be dropped irrevocably from the program.

**Appointment of Doctoral Committee**

As a result of a successful comprehensive examination, the department chair, on the advice of the student and his or her advisor, recommends appointment of a doctoral committee to the Dean of Graduate Education. The doctoral committee guides the student, approves the dissertation topic, and conducts the final examination. The rules* are as follows:

(i) The committee must have at least five members from the graduate faculty of the University of Hawaii at Manoa.

(ii) At least one will be a UH-Manoa faculty member NOT affiliated with the Department of Geology and Geophysics (for example, a professor from geography or oceanography) and is formally recognized as the University Representative (formerly the Outside Member)

(iii) The chair and a majority of members must be from the student's field of study and affiliated with the Department of Geology and Geophysics.

* Deciding who is eligible to be a member of your committee is one of the most difficult tasks you will face. The graduate faculty is a group of scholars who have been selected to work with and advise graduate students. It includes regular members, whose academic appointment is in the school housing the graduate field affiliates from outside the University. All three classes may serve on a doctoral committee. Most HIGP graduate faculty are appointed via our department and therefore do NOT meet criterion (ii) above. Affiliate graduate faculty (people outside the UH system) do NOT qualify as an “outside member” either, as the person must be a UH Manoa employee. You must, in consultation with your advisor, identify a willing regular member of the graduate faculty from another graduate field of study (e.g., geography, meteorology, oceanography, sociology) to serve as your outside member. At the discretion of the department chair, the committee MAY include a specialist from outside the graduate faculty. Your advisor will need to submit a written request plus the individual's CV to the department chair in order to achieve this.

**Approval of Dissertation Topic**

Approval of the dissertation topic requires a successful oral defense of a written dissertation proposal before the doctoral committee. The proposal will include a clear statement of the problem or problems to be investigated, the relationship of the problems to the broader aspects of geological science as referenced by classic
and current literature, and an outline of the proposed methods of approaching the problem, including a timetable, estimates of cost, and any computer time, equipment or facilities needed. You MUST talk with your advisor concerning her or his expectations of you in this regard. The committee will record approval on Form II. Once the form is accepted the candidate may then register for Dissertation Research, GG 800, during his or her remaining semesters.

Although candidates should look to the chair of the doctoral committee for primary direction regarding research methods and the preparation of results, it is the joint responsibility of the candidate and his or her chair to keep all committee members informed of the scope, plan, and progress of research and writing. Each semester, the student should meet with the committee (see below).

Current instructions for the preparation of the dissertation are available at www.hawaii.edu/graduate/sitemap.htm. The department urges that the dissertation be organized and written so that whole sections or chapters can be submitted for publication with a minimum of rewriting and editing.

The purpose of the dissertation is to allow a student to develop an original scientific project under the tutelage of a faculty mentor, so as to add to the knowledge of the discipline and to establish the student as a qualified scientist in his or her own right. The research program typically involves:

(1) A survey of the literature to establish a broad base of knowledge.
(2) Making new measurements or finding an intriguing and previously undiscovered method of understanding existing data.
(3) Explaining the results, defending the thesis, and publishing.

It is especially important for students to gain direct, first-hand experience in creating their own database when this is practical and feasible. In any case, scientific integrity mandates that the student fully acknowledge in the dissertation all collaboration; e.g., samples, sample preparation, measurements, analyses, data, or computer algorithms produced by others involved in the crafting of the thesis research.

In the range of endeavors that encompass modern research, from single-investigator to complex multi-investigator programs, the level and intricacy of collaboration vary. It is important for the graduate student to identify and carve out a niche that will allow the student to make unique and valuable contributions, as well as to acknowledge the contributions made by others to his or her progress and professional development.

**Application for Degree (PhD)**

Deadlines are within the first month of each semester (including summer). Visit the Office of Graduate Education’s website for the application form.

**Schedule Dissertation Defense**

Copies of the completed dissertation must be submitted to all committee members at least four weeks prior to the date of the final oral examination, and the Office of Graduate Education must be notified at least three weeks prior to the examination. The policy of the Geology and Geophysics Department is that a student should not be permitted to defend until his or her committee has agreed that the written dissertation is defensible; i.e., that the dissertation is likely to require only modest revisions in consequence of the oral defense.

**Dissertation Defense Announcement**

Announcements should be posted at least one week prior to the date of the scheduled defense. The announcement must specify title, date, time, and place of defense. It also needs to include the student’s abstract. Students should provide the above information to the unit secretaries for electronic and paper posting as soon as possible.

**Dissertation Defense (final examination for PhD)**

A public oral examination in defense of the dissertation is required of all candidates. It must be passed at least six weeks before the end of the semester or summer session in which the degree is granted. It must be at least one hour in duration. All members of the doctoral committee must be present.

The candidate presents the salient points of the background, methods, results, and conclusions of the research in a period of about 45 minutes. The chair of the dissertation committee then will ask for questions from members of the graduate faculty and the public. Following the open question period, there will be a closed-session question and answer period with the dissertation committee.

When questioning is completed, all members of the doctoral committee vote in private session on the candidate’s performance. A majority of the members must vote “pass”; otherwise, the candidate fails. A member voting in the minority may request a review by the Dean of Graduate Education. A candidate who fails may petition to repeat the final examination. Upon a second failure, the student is dropped from candidacy. Approval of the dissertation defense is noted by filing Departmental Form III.
Revision of Written Dissertation in Light of Committee’s Evaluation

Modest rewriting of the dissertation may be needed. The doctoral committee, including the advisor, is required to make their judgment of the dissertation on Form III, and a minimum of three committee members must sign the signature page of the final dissertation. Students are cautioned to acquaint themselves with the deadline for submission of the dissertation to the Office of Graduate Education, as well as deadlines for fees, doctoral forms, and the dissertation abstract.

Submission of Form IV and Dissertation

A copy of the approved dissertation must be submitted to the Office of Graduate Education together with the completed UMI forms and payment of fees. All students in the Geology and Geophysics Department are required to submit a pdf file on CD and a printed copy of the dissertation to the Geology and Geophysics Department office prior to graduation. The Office of Graduate Education’s Student Progress Form IV will be submitted by the department when the dissertation documents are in hand.

Exit Interviews

All graduate students in Geology and Geophysics are required to participate in an exit interview prior to graduation. The Office of Graduate Education’s Student Progress Form III will be signed by the department’s graduate chair only upon completion of the exit interview. Interviews will not be conducted by faculty members. These required interviews are conducted as part of the University of Hawaii’s accreditation with the Western Association of Schools and Colleges (WASC).

Graduate Chair Certifies Degree Requirements

The graduate chair submits the Certification of Degree Award, attesting that all degree requirements have been met.

Conferral of Degree

Degrees are conferred three times annually: December, May, and August.

Semester Evaluations/Graduate Student Committee Report

Department policy requires that a graduate student meet with the thesis/dissertation committee every semester to review progress and seek guidance. It is the student’s responsibility to organize this meeting and to complete the required form. In the rare case when a meeting of all committee members is not possible, a gathering of those who are available will occur, and the missing faculty member will be provided with a copy of the form. A form to document completion of the evaluation is available at:

www.soest.hawaii.edu/asp/GG/resources/official_forms.asp under G&G Official Forms

Annual Evaluation (All graduate students)

The academic record of all students and the length of time taken to earn that record will be evaluated annually in mid-spring. This evaluation of progress will include a written statement of progress and problems from the student, and an interview of the student by members of the Graduate Studies Committee. The student’s advisor or committee chair, or his or her employer (if any), will not be present at the oral evaluation, although they will complete written evaluations. Members of the Graduate Studies Committee will review and evaluate the student’s plan of study and progress. All evaluators will report their opinions to the Graduate Studies Committee and the department chair, including how deserving of financial aid and office space each student is for the following year. Suggestions from students for departmental improvements are strongly encouraged during the interview. The results of the spring evaluation become part of the student’s file.

Time Allowed

In general, the department expects that a student progressing normally will complete the PhD degree within six semesters of residence if he or she arrives with a MS in a geological field, and within eight semesters for other backgrounds. The department will strive to provide space and support for students for this period. The Office of Graduate Education states that candidates for doctoral degrees are expected to complete all requirements within seven years after admission into the doctoral program. Candidates who fail to complete all requirements within this specified time are automatically dropped from the program. Reinstatement for a limited period of time is only possible upon favorable recommendation of the dissertation committee and the department chair and with concurrence of the Dean of Graduate Education.
Funding
The initial offer letter details the department’s commitment to funding. No funding is guaranteed beyond the initial offer. If additional funding is needed to complete the degree, this must be negotiated with the advisor and the department chair. Criteria for additional funding include the student’s progress toward completion of the degree, availability of support, and the nature of problem that prevented the student from completing the degree as planned. Priority for awarding Teaching Assistantships is given to students within their first two years in the Department.

MS en Route
The MS en-route plan is for PhD students who decide to complete both their master’s and doctoral degrees within seven years at UH-Manoa. These students will be considered MS students until all requirements for the MS program are fulfilled. Switching between MS and PhD can take place at any time as long as these students are aware of their time constraints.

For example: If a MS en-route student completes the MS program in two years and goes on unofficial leave from the university for two years then decides to return to obtain a PhD, that student will have a total of three years to complete the program (7 years minus 2 years to complete the master’s program minus 2 years of unofficial leave equals 3 years to complete the doctoral program).

Summary of Procedure
1. Preliminary conference; appointment of preliminary advisor (Student Progress Form I).
2. Qualifying examination, if applicable (Form I).
3. Admission to candidacy (Form I).
4. Comprehensive examination (Departmental Form IA).
5. Appointment of doctoral committee (Form II).
6. Approval of dissertation proposal (Form II).
7. Application for degree.
9. Final examination (defense of dissertation) (Departmental Form III)
10. Revision of written dissertation in light of committee’s evaluations.
11. Submit pdf file on CD and a hard copy of written dissertation to the GG Department Office.
12. Exit interview.
13. Submit Form IV. Submit 1 copy of dissertation with CD to Graduate Division, then pay fees.
14. Graduate chair certifies all degree requirements have been met.
15. Conferral of degree.

PhD TIMETABLE AND SEQUENCE OF PROGRESS REPORT FORM

Without MS or with non-geological MS

<table>
<thead>
<tr>
<th>FORM</th>
<th>TASK</th>
<th>NORMAL PROGRESS</th>
<th>YOUR PROGRESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.</td>
<td>Preliminary Conference</td>
<td>1st semester</td>
<td></td>
</tr>
<tr>
<td>I.</td>
<td>Qualifying Examination</td>
<td>Beginning of 2nd semester</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Admission to Candidacy</td>
<td>3rd semester</td>
<td></td>
</tr>
<tr>
<td>IA.**</td>
<td>Approval of Comps. Committee</td>
<td>At least 4 months before comp. exam</td>
<td></td>
</tr>
<tr>
<td>IB.**</td>
<td>Timeline of Comps. Exam</td>
<td>As soon as committee is formed.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>FORM</td>
<td>TASK</td>
<td>NORMAL PROGRESS</td>
</tr>
<tr>
<td>---</td>
<td>------</td>
<td>------------------------------------------</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td>I</td>
<td>Preliminary Conference</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; semester</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>Admission to Candidacy</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; semester</td>
<td></td>
</tr>
<tr>
<td>IA</td>
<td>Approval of Comps. Committee</td>
<td>At least 4 months before comp. exam</td>
<td></td>
</tr>
<tr>
<td>IB</td>
<td>Timeline of Comps. Exam</td>
<td>As soon as committee is formed.</td>
<td></td>
</tr>
<tr>
<td>IC</td>
<td>Comprehensive Exam</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; semester</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>Approval of Doctoral Committee</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; semester</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>Approval of Dissertation Topic</td>
<td>3&lt;sup&gt;rd&lt;/sup&gt; semester</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>Dissertation Defense (final exam)</td>
<td>6&lt;sup&gt;th&lt;/sup&gt; semester*</td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>Dissertation Approval</td>
<td>6&lt;sup&gt;th&lt;/sup&gt; semester *</td>
<td></td>
</tr>
</tbody>
</table>

*The Graduate Studies Committee may under some circumstances consider the 8th semester to be normal progress.

** GG Department Forms
AREA REQUIREMENTS
MARINE AND ENVIRONMENTAL GEOLOGY

Courses: May be taken as an undergraduate or graduate student.

A. Basic:
   MATH 241-242 Calculus I, II
   PHYS 170-272 and Labs General Physics I, II and labs
   CHEM 161-162 and Labs General Chemistry I, II and labs
   GG 200 Geological Inquiry
   GG 303 Structural Geology
   GG 304 or GG 450 Physics of the Earth and Planets or Geophysical Methods
   GG 305 Geological Field Methods

Either group below, depending on the track that the student is interested in pursuing:

1. General Geology
   GG 301 Mineralogy
   GG 302 Igneous and Metamorphic Petrology
   GG 309 Sedimentology and Stratigraphy
   GG 413 Geological Data Analysis I

2. Earth Dynamics and Mechanics
   GG 312 Geomathematics
   GG 413 Geological Data Analysis I

B. Additional for the area: Normally six courses, at least one from each of three of the four categories below, are required. = GG courses taught in the last two years.

1. General marine geology, including tectonics:
   GG 423 Marine Geology
   GG 625 Seminar in Marine Geology and Geophysics
   GG 672 Seminar in Tectonics

2. Sedimentology, paleontology, geochemistry, and petrology:
   GG 300 Volcanology
   GG 301 Mineralogy
   GG 302 Igneous and Metamorphic Petrology
   GG 325 Geochemistry
   GG 420 Coastal Geology
   GG 421 Geologic Record of Climate Change
   GG 425 Environmental Geochemistry
   GG 603 Petrology of Ocean Lithosphere
   GG 641 Origin of Sedimentary Rocks
   GG 644 Sedimentary Geochemistry
   GG 674 Paleoceanography
   OCN 623 Chemical Oceanography
   OCN 643 Topics in Marine Geochemistry
3. Exploration and general geophysics:
   - GG 450 Geophysical Methods
   - GG 600 Equations of Geophysics
   - GG 650 Seismology
   - GG 651 Geomagnetism and Cosmic Magnetism
   - GG 652 Gravity, Magnetics, and Heat Flow
   - GG 681 Continuum Mechanics
   - GG 685 Geophysical Inverse Theory
   - GG 691 Geological Data Analysis II
   - GG 701 Physics of the Earth’s Interior
   - GG 703 Fractures and Faults
   - OCN 620 Physical Oceanography

4. Other related courses:
   - GG 312 Geomathematics
   - MATH 243 Calculus III
   - MATH 244 Calculus IV
   - MATH 311 Introduction to Linear Algebra
   - MATH 371 Elementary Probability Theory
   - MATH 402 Partial Differential Equations
   - MATH 407 Numerical Analysis
   - PHYS 310 Theoretical Mechanics I
   - PHYS 350 Electricity and Magnetism
   - PHYS 400 Applications of Mathematics in Physical Sciences
   - PHYS 600 Methods of Theoretical Physics

Certain chemistry, zoology, oceanography, and ocean engineering courses
PLANETOLOGY AND REMOTE SENSING

The graduate program in Planetary Geosciences within the Department of Geology and Geophysics is designed to provide a broad understanding of the multidisciplinary field of planetary science and terrestrial remote sensing, as well as to develop competency in an area of specialization. This philosophy implies that after completion of this program a student will be able to understand and contribute research in fields that are related to the study of the Solar System. These fields include, but are not limited to, astronomy, chemistry, geology, geophysics, mathematics, meteorology, oceanography, and physics.

Note: Because of the very wide range of disciplines that are spanned by this area, a large amount of flexibility in specific course programs is necessary. It is recognized that in a significant number of cases the student’s program will be tailored for that individual by the student, advisor, and committee.

Courses

A. Basic: Demonstration of proficiency in the following courses or equivalents is expected:

- GG 301 Mineralogy
- GG 302 Igneous and Metamorphic Petrology
- GG 303 Structural Geology
- GG 304 or GG 450 Physics of the Earth and Planets or Geophysical Methods
- GG 305 Geological Field Methods
- GG 325 Geochemistry
- GG 466 Planetary Geology
  Math through calculus and differential equations, physics, and computer programming

B. Required Courses: Because planetary sciences involve a wide range of disciplines, students are strongly encouraged to take a broad range of planetary courses in addition to those courses that are required for a particular field of study. At least 9 credits (3 courses) must be taken from the following. \( = \) GG courses taught in the last two years.

- GG 666 Planetary Surfaces
- GG 669 Formation of the Solar System
- GG 670B Geology of Planetary Bodies: The Moon
- GG 670C Geology of Planetary Bodies: Mars
- GG 671B Remote Sensing: Planets
- GG 671C Remote Sensing: Volcanoes
- GG 673B Extraterrestrial Materials: Meteorites
- GG 673C Extraterrestrial Materials: Petrology of the Moon and Mars
- GG 681 Continuum Mechanics

In addition, students must receive 1 credit for each of two semesters for GG 665 (Current Readings in Planetary Science). Normally, not more than 6 of the total 30 credits required for an MS degree can be for courses at the 300-500 level.
C. Courses that can contribute toward the fulfillment of program requirements:

1. Other planetary science courses:
   - GG 711 Special Topics in Geology and Geophysics

2. All other GG courses

3. Physics and Astronomy
   - ASTR 630 The Solar System
   - ASTR 633 Astrophysical Techniques
   - Upper-level physics courses

4. Chemistry
   - CHEM 351-352 Physical Chemistry I and II

5. Oceanography
   - OCN 638 Earth System Science and Global Change
   - OCN 640 Physical Oceanography

6. Meteorology
   - MET 600 Atmospheric Dynamics I
   - MET 601 Atmospheric Dynamics II
   - MET 620 Physical Meteorology

7. Additional courses (e.g., numerical methods, statistics, computer science, remote sensing, and engineering) from other departments that the student’s MS or PhD committee and the Department of Geology and Geophysics deem necessary for the fulfillment of course requirements. A course plan should be developed with the advisor to reflect the specific interest and needs of the student. The plan should be flexible, and updated subject to the learning needs of the student, as well to recommendations of the advisor and committee on recognizing areas of weakness and/or new areas of desired skill development.
GEOPHYSICS AND TECTONICS

Advances in these disciplines depend largely on a basic knowledge of physics, mathematics, and chemistry, and on the ability to apply these collateral sciences to geological problems. For this reason, the best preparation for graduate work combines an adequate background in related sciences and mathematics with a basic introduction to the geological sciences.

The background required of master's students is usually obtained during undergraduate studies but may be completed during graduate school. This background should include:

- Math - through differential equations
- Physics - 2 years
- Chemistry - 1 year
- Elementary geophysics and geophysical prospecting
- Introductory geology, mineralogy, petrology, and structural geology
- One computer programming course or proficiency in programming (preferably in C, C++, MATLAB, or PERL)

Students in geophysics must take five of the following core courses. = GG courses taught in the last two years.

1. GG 600 Equations of Geophysics
2. GG 681 Continuum Mechanics
3. GG 652 Gravity, Magnetics, and Heat Flow
4. GG 650 Seismology
5. GG 691 or GG 685 Geological Data Analysis II or Geophysical Inverse Theory
6. GG 701 Physics of the Earth's Interior
7. GG 703 Fractures and Faults
The graduate program in Volcanology, Geochemistry, and Petrology is designed to provide a broad understanding in these fields. In physical volcanology, areas of coverage include hazards, physical processes, field methods and data processing/application. In geochemistry and petrology, coverage includes elements of igneous, sedimentary and metamorphic geochemistry and petrology theory, as well as analysis skills. Upon completion of the program the student will be able to understand and contribute to these fields. Given the demands of the subject area, an adequate background in mathematics and the sciences is required.

Courses: May be taken as an undergraduate or graduate student. Equivalent coursework from other institutions can be substituted upon approval of the student’s committee.

A. Basic: (student should already have taken these, or equivalent, courses as an undergraduate)

- GG 200 Geological Inquiry
- GG 304 or GG450 Physics of the Earth and Planets or Geophysical Methods
- GG 305 Geological Field Methods
- GG 325 Geochemistry
- MATH 241-242 Calculus I-II
- PHYS 151-152 and Labs College Physics I, II and labs (or PHYS 170-272 and Labs)
- CHEM 161-162 and Labs General Chemistry I, II and labs

Normally, a total of at least six courses from the first four categories below. Especially useful courses are underlined. = GG courses taught in the last two years.

1. Volcanology:
   - GG 300 Volcanology
   - GG 601 Explosive Volcanism
   - GG 604 Disaster Management
   - GG 605 Lava Flow Rheology and Morphology
   - GG 606 Current Events in Volcanology

2. Petrology:
   - GG 302 Igneous and Metamorphic Petrology
   - GG 602 Theoretical Petrology
   - GG 603 Petrology of Ocean Lithosphere
   - GG 621 Electron Microprobe Analysis

3. Geochemistry:
   - GG 608 Isotopes and Trace Elements

4. Allied Geology and Geophysics courses:
   - GG 303 Structural Geology
   - GG 312 Geomathematics
   - GG 413 Geological Data Analysis I
   - GG 407 Energy and Mineral Resources
   - GG 423 Marine Geology
   - GG 425 Environmental Geochemistry
   - GG 430 Geology and Mineral Resources of Asia
   - GG 444 Plate Tectonics
   - GG 455 Hydrogeology and lab
   - GG 460 Geological Remote Sensing
   - GG 466 Planetary Geology
   - GG 621 Electron Microprobe Analysis
   - GG 641 Origin of Sedimentary Rocks
   - GG 672 Seminar in Tectonics
   - GG 701 Physics of the Earth’s Interior
   - GG 711-003 Advanced Topics in Signal Processing and Data Inversion
5. Other fields:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 274-274L</td>
<td>Principles of Analytical Chemistry</td>
</tr>
<tr>
<td>CHEM 351 and 352</td>
<td>Physical Chemistry I, II</td>
</tr>
<tr>
<td>CHEM 658</td>
<td>Crystallography</td>
</tr>
<tr>
<td>PHYS 274</td>
<td>General Physics III</td>
</tr>
<tr>
<td>PHYS 350</td>
<td>Electricity and Magnetism</td>
</tr>
<tr>
<td>PHYS 430</td>
<td>Thermodynamics and Statistical Mechanics</td>
</tr>
<tr>
<td>MATH 243-244</td>
<td>Calculus III , IV</td>
</tr>
<tr>
<td>MATH 311</td>
<td>Introduction to Linear Algebra</td>
</tr>
<tr>
<td>MATH 371</td>
<td>Elementary Probability Theory</td>
</tr>
<tr>
<td>OCN 631</td>
<td>Ocean Minerals</td>
</tr>
<tr>
<td>OCN 635</td>
<td>Isotopic Marine Geochemistry</td>
</tr>
<tr>
<td>CEE 320</td>
<td>Fluid Mechanics Fundamentals and lab</td>
</tr>
</tbody>
</table>
APPENDIX

WHO’S WHO

Department Chair .......................................................................................... Kenneth Rubin
Associate Chair ............................................................................................ Julia Hammer

SOEST Director of Student Services ............................................................... Leona Anthony
GG Office Manager ....................................................................................... Susan Van Gorder

GG POST 6th Floor Secretary ......................................................................... Alison Houghton
GG POST 7th Floor Secretary ......................................................................... Arlene Sullivan
GG POST 8th Floor Secretary ......................................................................... Pending Hire

Hawaii Institute of Geophysics and Planetology Director (Acting) ............ Peter J. Mouginis-Mark
Secretary to the Director ................................................................................ Violenda Nakahara
Hawaii Institute of Geophysics and Planetology Secretary ....................... Grace Furuya
Planetary Geosciences Secretary ..................................................................... Rena Lafevre
CREDIT HOURS AND COURSES
Here are some guidelines to follow when registering for classes.

Students who have defended their thesis/dissertation proposals may enroll in GG 700 (MS) or GG 800 (PhD).

For MS students, only courses taken for a grade will count toward your degree program (excluding GG 699 and GG 700). Courses taken only for credit will not count.

Both GG 699 and GG 700/800 can be taken during the same semester.

All TAs, RAs, and tuition waiver recipients are required to take 9 degree-related credits. Any number of credits over 9 will require permission. Form is available at www.hawaii.edu/graduate/download/forms/ga/ovrd/9cr.pdf

Each English Language Institute (ELI) course is equal to 3 credits.

Students who have applied for graduation may register for 1 credit of GG 700 or 800 and be considered full-time (this excludes TAs, RAs, and tuition waiver recipients). PhD students taking 1 credit of GG 800 have a special tuition and fee rate. MS students taking 1 credit of GG 700 do not have a special tuition and fee rate. To enroll in GG 700F, download the application from the Office of Graduate Education’s website.

EQUIPMENT SIGN-OUT
The department owns a small number of Brunton compasses and hand-held GPS units. When they are not reserved for class use, they can be borrowed for field work. To do so, please see the Geology and Geophysics Department office manager. You will be asked to sign a form that states that you agree to replace or repair whatever you borrow in the event that it is lost, stolen, or broken while in your custody.

RESERVING ROOMS
When you wish to reserve a room, make sure that you have the following information: date, time, room desired, alternates. If you are reserving a room for an exam or defense, make sure that the dates and times are mutually agreed upon by all members of your committee. See Geology and Geophysics Department office manager (POST 701) regarding room requests.

SETTING UP THESIS/DISSERTATION PROPOSALS
See appropriate personnel to reserve room. Ask Leona for Student Progress Form II.

SETTING UP COMPREHENSIVE EXAMS
For the oral portion of the exam, see appropriate personnel to reserve a room. For the written portion, seek out a place in one of the libraries on campus. Rooms may not be reserved to accommodate such a long exam for one person. See Leona for Student Progress Form II.

SETTING UP DEFENSES
See Susan or your Floor Secretary to assist you with the logistics. Make sure that you have the date, time, room desired and alternates decided before seeing her. Make sure that the date(s) and time(s) you selected have been mutually agreed upon by all members of your committee.

FORMS, FORMS, AND MORE FORMS
Just about everything has a form. If you did something and didn’t get a form, make sure you ask for one. You never know.

WEBSITES
University of Hawaii - http://manoa.hawaii.edu/
SOEST - http://www.soest.hawaii.edu/
Office of Graduate Education - http://manoa.hawaii.edu/grad/
CALENDAR OF EVENTS
The following are a few important events to keep in mind when planning your semesters. Please consult the University of Hawaii Catalog and posted announcements for specific dates.

JANUARY
Fall semester grades are posted on-line
Spring semester begins
Preliminary conferences for incoming graduate students
Registration for new and unclassified students
Deadline to receive graduate applications from students for the fall semester
Deadline to apply for spring graduation

FEBRUARY

MARCH
Deadline to defend for spring graduation
Deadline for restricted withdrawals
Spring Break

APRIL
Annual graduate student evaluations by Graduate Studies Committee
Deadline to submit Commitment of Graduate Assistantship forms for fall TAs and RAs
Fall registration for continuing classified students
Last day to remove I grades from previous semester’s work (April 1)
Submission of thesis/dissertation for spring graduation
Deadline to apply for the William T. Coulbourn Fellowship in Marine Geology
Deadline to apply for the Harold T. Stearns Fellowship

MAY
Annual GG awards presentation
Final Exams
Spring Graduation
Summer Session begins

JUNE
Spring semester grades are posted online
Deadline to defend for summer graduation
Deadline to apply for summer graduation
Summer Session I grades are posted online
JULY
Deadline to submit thesis/dissertation for summer graduation

AUGUST
Summer graduation
Summer Session II grades are posted online
Preliminary conferences for incoming graduate students
Fall semester begins
Registration for new and unclassified students
Deadline to receive graduate applications from students for the spring semester
Deadline to apply for fall graduation
Deadline to receive graduate applications from international students for spring
Deadline to apply for fall graduation

SEPTEMBER
Deadline to receive graduate applications from U.S. students for spring

OCTOBER
Deadline to defend for fall graduation

NOVEMBER
Deadline to submit Commitment of Graduate Assistantship forms for spring TAs and RAs
Spring registration for continuing classified students
Last day to remove I grades from previous semester’s work (November 1)
Submission of thesis/dissertation for fall graduation

DECEMBER
Final exams
Fall graduation
EXAMPLES OF STUDENT PROGRESS FORMS

Master’s and Doctoral

http://manoa.hawaii.edu/grad/download

Preprinted Progress Forms are included in each GG graduate student’s file.

Required forms originate from both the GG department and the Office of Graduate Education. Some Office of Graduate Education forms have been modified to include department requirements.
Master's Plan A – Pre-Candidacy Progress (Form I)

Part I. To be completed by the student

Name ____________________________ UH ID No. ____________________________

Graduate Program: Geology & Geophysics Degree Objective: MS

Part II. To be completed by the graduate chair

Interim Academic Adviser: ____________________________ Preliminary Conference: MM/DD/YY

Will the student be transferring credits? ☐ No ☐ Yes (If yes, attach Petition to Transfer Credits.)

Does the student have any deficiencies? ☐ No ☐ Yes (If yes, provide details in the space below.)

<table>
<thead>
<tr>
<th>Deficiency (Course or Skill)</th>
<th>Remedy for Deficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exam</th>
<th>Not Required</th>
<th>MM/DD/YY</th>
<th>Passed</th>
<th>Failed</th>
</tr>
</thead>
<tbody>
<tr>
<td>General or Qualifying Exam</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General or Qualifying Exam (Repeat if failed the first time.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Language Exam (Language: ____________________________ )</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Signature of Graduate Chair: ____________________________ Date: ____________________________

GRADUATE DIVISION ACTION

☐ Approved ☐ Not Approved By: ____________________________ Date: ____________________________

Remarks

C: Graduate Program
Master's Plan A – Advance to Candidacy (Form II)

Part I. To be completed by the student

Name ____________________________ LAST, FIRST, M.I. UH ID No. ____________

Graduate Program ___________________ Geology & Geophysics ______________ Degree Objective MS ____

Thesis Topic: ____________________________

I certify that I have read and understand the policies and instructions for this form.

☐ YES ☐ NO My research requires approval by one or more of the following: Committee on Human Studies, Environmental, Health, and Safety Office, and/or Institutional Animal Care and Use Committee. If yes, attach a copy of the approval letter(s). Enrollment in Thesis 700 will not be permitted until such approval is obtained.

Signature of Student ____________________________ Date ____________

Obtain approval signatures from the thesis committee:

We certify that we have reviewed the proposed research and found that the proposal is 1) appropriate to the student’s academic discipline, and 2) in compliance with the policies and instructions for this form.

<table>
<thead>
<tr>
<th>Name (Type or Print)</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chair</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Member</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Part II. To be completed by the graduate chair

<table>
<thead>
<tr>
<th>Exam</th>
<th>Not Required</th>
<th>MM/DD/YY</th>
<th>Passed</th>
<th>Failed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Second Language Exam (Language: ____________)</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Advance to Candidacy: ☐ Recommended ☐ Not Recommended

Signature of Graduate Chair ____________________________ Date ____________

GRADUATE DIVISION ACTION

☐ Approved ☐ Not Approved By ____________________________ Date ____________

Remarks

C: Graduate Program / Student
Master's Plan A – Thesis Evaluation (Form III)

Part I. To be completed by the student

Name ___________________________ UH ID No. ___________________________

Graduate Program: Geology & Geophysics

Degree Objective: MS

Include specialization if applicable:

Date of Final Oral Exam / Defense ___________ MM/DD/YYYY

I certify that I have read and understand the policies and instructions for this form.

Signature of Student ___________________________ Date ___________

Obtain signatures from the thesis committee:

We certify that we have read and understand the policies and instructions for this form.

<table>
<thead>
<tr>
<th>Name (Print or Type)</th>
<th>Signature</th>
<th>Passed</th>
<th>Failed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chair</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Member</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Member</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Member</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Part II. To be completed by the graduate chair

☐ Approved ☐ Not Approved

Signature of Graduate Chair ___________________________ Date ___________

GRADUATE DIVISION ACTION

☐ Approved ☐ Not Approved By ___________________________ Date ___________

Remarks

C: Graduate Program / Student
Master's Plan A – Thesis Submission (Form IV)

Part I. To be completed by the student

Name ___________________________ LAST, FIRST, M.I. ___________________________ UH ID No. ___________________________

Graduate Program: Geology & Geophysics

Degree Objective: MS

I certify that I have read and understand the policies and instructions for this form.

Signature of Student ____________________________________________________________________________________________ Date __________

Obtain signatures from the thesis committee:

We certify that we have read and understand the policies and instructions for this form. We hereby approve both the content and the form of this thesis.

<table>
<thead>
<tr>
<th>Name (Print or Type)</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chair</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Member</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Additional GG Department Requirements:

Exit Interview completed on ___________________________ by ___________________________

Bounded copy of thesis was received by Department on ___________________________

I will/will not authorize the GG Department to post my thesis online: ___________________________ Student signature

PDF of thesis received on: ___________________________

GRADUATE DIVISION ACTION

☐ Approved ☐ Not Approved By ___________________________ Date ___________________________

Remarks

C: Graduate Program
UNIVERSITY OF HAWAI‘I AT MĀNOA

Graduate Division
Student Academic Services
Records Office

Doctorate – Pre-Candidacy Progress (Form I)

Part I. To be completed by the student

Name ___________________________ UH ID No. ______________
LAST, FIRST, M.I.

Graduate Program ___________________________ Degree Objective PHD
Geology & Geophysics

INCLUDE SPECIALIZATION IF APPLICABLE.

Part II. To be completed by the graduate chair

Interim Academic Adviser ________________ Preliminary Conference MM/DD/YY

Does the student have any deficiencies? □ No □ Yes (If yes, provide details in the space below.)

<table>
<thead>
<tr>
<th>Deficiency (Course or Skill)</th>
<th>Remedy for Deficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exam</th>
<th>Not Required</th>
<th>MM/DD/YY</th>
<th>Passed</th>
<th>Failed</th>
</tr>
</thead>
<tbody>
<tr>
<td>General or Qualifying Exam</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General or Qualifying Exam (Repeat if failed the first time.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Language Exam (Language: ____________)</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Signature of Graduate Chair ___________________________ Date ________________

GRADUATE DIVISION ACTION

☐ Approved ☐ Not Approved By ___________________________ Date ________________

Remarks

C: Graduate Program
Doctorate
Student Progress Form IA
Proposal of Comprehensive Examination Committee

Student’s Name: ____________________________  Field of Study: G&G

Examination committee: Graduate Division states that the comprehensive examination will be conducted by “the graduate faculty or a subcommittee thereof”. In the Department of Geology and Geophysics, this subcommittee consists of at least five members, and at least two must come from outside the student’s Area of Interest. The Department currently recognizes four Areas of Interest: 1) Geophysics & Tectonics; 2) Marine & Environmental Geology; 3) Volcanology, Geochemistry & Petrology and 4) Planetary Geosciences & Remote Sensing). The examination committee must be approved by the GG Chair prior to the examination.

1) Chairperson

2) Member outside of student’s area of interest

3) Member outside of student’s area of interest

4) Member

5) Member

6) Member

Student’s Signature Date Approved by Graduate Chair Date

April 2008
Doctorate
Student Progress Form IB
Results of Comprehensive Examination

Student's Name: ____________________________  Field of Study: G&G

Student's I.D.#: ____________________________  Degree Objective: PhD

<table>
<thead>
<tr>
<th>DATE</th>
<th>FIELD OR AREA</th>
<th>ORAL/WRITTEN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Passed (signatures)
Chairperson ____________________________
Member outside student's area of interest

Failed (signatures)

Member outside student's area of interest

Member
Member
Member

Approved by Graduate Chair  Date

June 2005
Doctorate

Student Progress Form IC

Results of Comprehensive Examination

Student's Name: ___________________________  Field of Study: G&G

Student's I.D.#: ___________________________  Degree Objective: PhD

<table>
<thead>
<tr>
<th>Date</th>
<th>Field or Area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Decision:  Pass _____  Conditional Pass _____  Fail _____

This section is only completed for Conditional Pass and Fail (use additional sheets if needed).

<table>
<thead>
<tr>
<th>Names</th>
<th>Signatures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Chairperson</td>
<td></td>
</tr>
<tr>
<td>2. Advisor</td>
<td></td>
</tr>
<tr>
<td>3. Member</td>
<td></td>
</tr>
<tr>
<td>4. Member outside student’s area of interest</td>
<td></td>
</tr>
<tr>
<td>5. Member outside student’s area of interest</td>
<td></td>
</tr>
</tbody>
</table>

Student’s Signature  Date  Approved by Graduate Chair  Date

1680 East-West Road, Honolulu, Hawai'i 96822
Doctorate
Student Progress Form 1D
Evaluation of Remedial Work and resulting decision on the Comprehensive Examination
(This form is required only for students who received a Conditional Pass on form 1C.)

Student’s Name: _________________________________ Field of Study: G&G
Student’s I.D.#: ___________________________________________ Degree Objective: PhD

Today’s Date

Field or Area
_____________________________________________________________________________________
_____________________________________________________________________________________

Date the Comprehensive Exam was taken: __________________________________________
Date assigned for completion of remedial work: __________________________________

Committee’s evaluation of remedial work:  Satisfactory  Unsatisfactory

If remedial work is satisfactory, the student is deemed to have passed the Comprehensive Examination.

If remedial work is unsatisfactory, the student is deemed to have failed the Comprehensive Examination. The student must re-take the Comprehensive Examination within six months of today’s date. Failure to pass the second attempt at the Comprehensive Examination will result in the student being dropped irrevocably from the Doctoral Program.

Names  Signature
1. Chairperson  ____________________
2. Advisor  _______________________
3. Member  _______________________
4. Member outside student’s area of interest  _______________________
5. Member outside student’s area of interest  _______________________

_____________________________________________________________________________________

_____________________________________________________________________________________

_____________________________________________________________________________________

_____________________________________________________________________________________

1680 East-West Road, Honolulu, Hawai‘i 96822
Telephone: (808) 956-7640, Facsimile: (808) 956-5512
An Equal Opportunity/Affirmative Action Institution
DOCTORATE – ADVANCE TO CANDIDACY (FORM II)

PART I. TO BE COMPLETED BY THE STUDENT

Name ____________________________ UH ID No. ____________________________

Graduate Program: Geology & Geophysics

Degree Objective: PHD

Dissertation Topic: ____________________________

I certify that I have read and understand the policies and instructions for this form.

☐ YES  ☐ NO My research requires approval by one or more of the following: Committee on Human Studies, Environmental, Health, and Safety Office, and/or Institutional Animal Care and Use Committee. If yes, attach a copy of the approval letter(s). Enrollment in Dissertation 800 will not be permitted until such approval is obtained.

Signature of Student ____________________________ Date ____________________________

OBTAIN APPROVAL SIGNATURES FROM THE DISSERTATION COMMITTEE:

We certify that we have reviewed the proposed research and found that the proposal is 1) appropriate to the student’s academic discipline, and 2) in compliance with the policies and instructions for this form.

<table>
<thead>
<tr>
<th>Name (Type or Print)</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chair</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>University Representative</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If any of the faculty listed are not on the graduate faculty, submit a current Curriculum Vitae and a petition explaining why they should be included on the committee.

PART II. TO BE COMPLETED BY THE GRADUATE CHAIR

Exams

Not Required MM/DD/YY Passed Failed

Comprehensive Exam (oral or oral & written)

Comprehensive Exam (Repeat if failed the first time.)

Second Language Exam (Language: ____________________________ ) ☑

Advance to Candidacy: ☐ Recommended ☐ Not Recommended

☐ Issuance of ABD Certificate Requested

Signature of Graduate Chair ____________________________ Date ____________________________

GRADUATE DIVISION ACTION

☐ Approved ☐ Not Approved  By ____________________________ Date ____________________________

Remarks

C: Graduate Program

8244 UHMC, University of Hawaii Manoa, Honolulu, Hawaii 96822
Doctorate – Dissertation Evaluation (Form III)

Part I. To be completed by the student

Name ___________________________ UH ID No. ________________________

Graduate Program Geology & Geophysics Degree Objective PHD

Date of Final Oral Exam / Defense _______________ MM/DD/YYYY

I certify that I have read and understand the policies and instructions for this form.

Signature of Student ___________________________ Date _______________

Obtain signatures from the dissertation committee:
We certify that we have read and understand the policies and instructions for this form.

<table>
<thead>
<tr>
<th>Name (Print or Type)</th>
<th>Signature</th>
<th>Passed</th>
<th>Failed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chair</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Member</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Member</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Member</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Member</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>University Representative</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Part II. To be completed by the graduate chair

☐ Approved ☐ Not Approved

Signature of Graduate Chair ___________________________ Date _______________

GRADUATE DIVISION ACTION

☐ Approved ☐ Not Approved By ___________________________ Date _______________

Remarks

C: Graduate Program

9540 Hālāwai Street, Suite 252 Honolulu, Hawai‘i 96822
Doctorate – Dissertation Submission (Form IV)

Part I. To be completed by the student

Name ___________________________ UH ID No. ___________________________

Graduate Program: Geology & Geophysics

Degree Objective: PHD

I certify that I have read and understand the policies and instructions for this form.

Signature of Student ___________________________ Date ___________________________

Obtain signatures from the dissertation committee:

We certify that we have read and understand the policies and instructions for this form. We hereby approve both the content and the form of this dissertation.

<table>
<thead>
<tr>
<th>Name (Print or Type)</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chair</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>University Representative</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Additional GG Department Requirements:

Exit Interview completed on ___________________________ by ___________________________.

Bounded copy of dissertation was received by Department on ___________________________.

I will/will not authorize the GG Department to post my dissertation online: ___________________________. Student Signature ___________________________.

PDF of dissertation received on: ___________________________.

GRADUATE DIVISION ACTION

☐ Approved ☐ Not Approved By ___________________________ Date ___________________________

Remarks

C: Graduate Program
Department of Geology and Geophysics
School of Ocean and Earth Science and Technology
University of Hawaiʻi at Manoa
1680 East-West Road, POST 701
Honolulu, HI 96822
(808) 956-7640
www.soest.hawaii.edu/GG

13 February 2015