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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 Graduate Division are stated in the University of Hawaii catalog and at www.hawaii.edu/graduate/sitemap.htm

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, Center for Microbial Oceanography: Research and Education, 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 general 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

HIGH-PRESSURE GEOPHYSICS AND GEOCHEMISTRY/MINERAL PHYSICS
This program offers exciting opportunities for studying the physio-chemical, thermodynamic, and structural properties of earth materials, including minerals, rocks, silicate melts, ceramics, metals, and alloys under high pressure and/or temperature. The mineral physics laboratories are used for both basic and applied research. Current research programs include high-pressure, high-temperature X-ray diffraction studies using a diamond-anvil cell for elucidating phase transitions and equations of state (EOS) of mantle minerals; ultrasonic studies for elastic, anelastic and EOS properties; Brillouin and Raman scattering studies on the interrelationship of elastic and structural properties in mantle minerals under high pressure; electrical conductivity studies to understand the role of partial melting in the transport properties of upper mantle rocks; and acoustic studies on marine sediments for developing geo-acoustic models.

HYDROGEOLOGY AND ENGINEERING GEOLOGY
This program provides students with opportunities to address practical and theoretical problems in geology, with a focus on physical processes that operate in the Earth's crust and that impact society. The types of phenomena currently under study include fluid-flow through rocks and soils, groundwater quantity and quality (with an emphasis on groundwater problems in the Hawaiian Islands), submarine groundwater discharge and its impact on coastal ecosystems, subaerial and submarine landslides, three-dimensional rock fracture processes, geothermal processes, and fault mechanics. Research characteristically involves a combination of field work, laboratory research, and computer modeling. Owing to the interdisciplinary nature of the problems being addressed, students can expect to interact with investigators in the Water Resources Research Center, College of Engineering, and Department of Tropical Plant and Soil Sciences. The graduate curriculum is largely elective so that it can be best tailored to the particular needs of the individual.

MARINE GEOLOGY AND GEOBIOLOGY
The focus of this program is to provide students with a diverse background that may combine geology, geochemistry, biogeochemistry, geobiology and microbial ecology for technical and professional work in marine science at industrial, governmental, and academic institutions. The combination has also been useful for students entering careers in industry. The University of Hawaii is ideally located to study tropical to sub-tropical oceanic and terrestrial environments. This program provides instructional and research opportunities in a wide range of topics, including sedimentology, stratigraphy, micropaleontology, paleoceanography, carbonate petrology, geological and geophysical investigations at sea, stable and radiogenic isotope geochemistry, organic geochemistry, biogeochemistry, terrestrial ecology, microbiology/microbial ecology, geobiology, chemical oceanography, coastal geology, littoral processes, sea-level change, geochemistry of marine sediments, geology of Pacific islands and atolls, remote sensing. Faculty in this program also study oceanic crustal and upper-mantle structure, geophysical instrumentation, marine acoustics, marine gravity, geomagnetism and paleomagnetism, geodynamics, petrography of volcanic islands and ocean crust, physical properties of sediments and crustal rocks, reflection and refraction seismology, and plate tectonics at accreting and subducting plate margins. These diverse research efforts involve several expeditions each year. Graduate students in the program are encouraged to participate in these expeditions as part of their career training.

PLANETARY GEOSCIENCES
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 the Earth, Moon, Mars and Mercury. Students from a wide range of backgrounds, including geology, astronomy, physics, 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 and comet 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 investigations, including submarine geology and physical volcanology.
GEOPHYSICS (SEISMOLOGY/SOLID EARTH GEOPHYSICS)

The Geophysics program covers the disciplines of seismology, geodesy, and geodynamics, and other applications of physics to the study of the Earth. In seismology, students study propagation, attenuation, and scattering of waves from earthquakes, explosions, and shipboard sources. Data from ocean bottom and borehole seismometers, as well as from land-based stations, help us to understand the structure and seismicity of passive and active plate margins and the growth of undersea volcanoes. Inversion and seismogram synthesis procedures aid in the interpretation of crustal structure and rock physics. In geodesy, students study crustal motion using the Global Positioning System (GPS), interferometric radar, and lidar observations. Current GPS research involves volcano deformation studies in Hawaii, plate motion studies in the South Pacific and South America, and measurements of atmospheric water vapor (in collaboration with the Department of Meteorology). Geodynamics emphasizes computer modeling of heat transfer and deformation in solid and fluid continua. Current research includes studies on mantle convection, lithosphere faulting and fracturing, and plate margin processes. The Geophysics program and Marine Geology and Geophysics program work in concert. The two programs share students and faculty, and many studies straddle the disciplinary boundaries.

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 conduct research projects within the department in conjunction with one or more of its six research areas as well as in other departments across campus. In addition, many 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. SOEST is a partner with the College of Engineering in hosting the Hawaii Space Flight Laboratory.

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. Students also have internet connections in their offices. 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 and 2 Macintosh workstations
- 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 a Linux cluster, with >150 cpu cores, 4 GB RAM per cpu core and many terabytes of of 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’imikai-o-Kanaloa* (mother ship to submersibles and ROV)*
*Pisces IV and Pisces V*, research submersibles with 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 MRI 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 GPS Facility
- 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 include the Center for Microbial Oceanography: Research and Education (C-MORE), Joint Institute for Marine and Atmospheric Research (JIMAR), Hawaii Institute of Marine Biology (HIMB), Institute for Astronomy, College of Tropical Agriculture and Human Resources, Hawaiian Volcano Observatory (USGS), Marine Fisheries Laboratory (NOAA), Pacific Islands Benthic Habitat Mapping Center (PIBHMC), Pacific Tsunami Warning Center and Magnetic Observatory (NOAA), Pacific Islands Ocean Observing System (PACIOOS), the International Pacific Research Center (IPRC), Pacific Research Center for Marine Biomedicine (PRCMB), and Center for Marine Microbial Ecology & Diversity (CMMED). 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
Clinton Conrad, PhD, MIT, 2000. Geophysics and geodynamics
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
James H. Foster, PhD, Hawaii, 2002. Geodesy, GPS meteorology
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, 1995. 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
A. Hope Jahren, PhD, UC Berkeley, 1996. Geobiology, terrestrial ecology and paleoecology
Kevin T.M. Johnson, PhD, MIT (Woods Hole), 1990. Mantle petrology and geochemistry, marine geology
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. Mouginis-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
Stephen M. Stanley, PhD, Yale, 1968, Paleontology and evolutionary biology
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
Roy H. Wilkens, PhD, U. of Washington, 1981. Physical properties
Cecily Wolfe, PhD, MIT (Woods Hole), 1994. Seismology, mid-ocean ridges

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. Trusdell, 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 Thaís 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.

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 Fellows 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.

HYDROGEOLOGY AND ENGINEERING GEOLOGY students combine principles of geology and civil engineering as a basis for solving practical problems in the utilization and conservation of natural resources, including water and urban land. A typical undergraduate background should have included basic courses in each of geology, chemistry, physics, and mathematics, and a major in geology, other physical sciences, or engineering. The student should be prepared for additional work in whatever combination of geology, geophysics, engineering, and geochemistry is appropriate.

MARINE GEOLOGY AND GEOBIOLOGY combines geological, geophysical, biogeochemical and geobiological studies to focus on investigation of the oceanic environments and terrestrial and marine ecosystems. Typically, a strong undergraduate major in geology or one of the other natural sciences, along with basic courses in physics, chemistry, biology, 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, biogeochemistry, geobiology, chemical oceanography, paleoceanography, remote sensing, or petrology, as applied to marine research.

PLANETARY GEOSCIENCES is a broad field that uses geological techniques to learn about the origin and evolution of the planets and solar system. Students are drawn from a wide range of backgrounds in geology and from outside the geosciences (e.g. astronomy, physics, computing and 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 uses 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, lithosphere deformation, and mantle convection. 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.

HIGH PRESSURE GEOPHYSICS AND GEOCHEMISTRY involves gaining an understanding of the nature of the Earth's crust and its deep interior through measurements of physical, chemical, and mechanical properties of pertinent Earth materials under high-pressure and high-temperature conditions. Entrance may be through chemistry, physics, engineering, or geology. A background in geology is necessary but can be obtained in graduate school, along with additional mathematics.

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 PROGRAM
For a complete listing of the requirements, PLEASE view the Graduate Division online site map at www.hawaii.edu/graduate/sitemap.htm. The Geology and Geophysics Department’s additions and modifications to the Graduate Division policies and procedures are explained below.

Master’s Plan A (Thesis)

Course Requirements (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 (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 (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 Graduate Division. For a current listing of graduate faculty members, visit: www.hawaii.edu/graduate/wa/selectmember.php.
Approval of Thesis Topic (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 Graduate Division 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 Graduate Division 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 Graduate Division 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 (Plan A)
Applications are located at http://manoa.hawaii.edu/grad/wp-content/uploads/mis/gradapp.pdf. Deadlines are within the first month of each semester (including summer).

Schedule Thesis Defense (Plan A)
Graduate Division 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 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 rescheduling 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 (Plan A)

The approved thesis and necessary copies are to be submitted to the Graduate Records Office, Spalding Hall Room 352. 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 Graduate Division'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 (Plan A)

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

Conferral of Degree (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 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 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 the Graduate Division.

**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 (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.

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

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<td>IV.</td>
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*GG Department Form*
Master's Plan B (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 (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 (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 (Plan B)

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

Research Proposal (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 he or she will participate. If the student is switching from Plan A to Plan B, the Graduate Studies Committee must approve the Plan B proposal.

Application for Graduation (Plan B)

Deadlines are within the first month of each semester. See http://manoa.hawaii.edu/grad/wp-content/uploads/mis/gradapp.pdf.
Research Defense (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 Graduate Division'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 (Plan B)
The graduate chair submits the Certification of Degree Award, attesting that all degree requirements have been met.

Conferral of Degree (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 the Graduate Division.

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 (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

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<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>
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<tr>
<td>II. Degree Committee Selection</td>
<td>During 2nd semester</td>
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<tr>
<td>II. Approval of Research Proposal</td>
<td>During 2nd semester</td>
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<tr>
<td>III. Final Exam</td>
<td>Within two years</td>
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</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 Graduate Division online site map: www.hawaii.edu/graduate/sitemap.htm. A summary of these procedures is given below.

Requirements for Coursework and Residence

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

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

The purpose of the qualifying examination is to determine whether 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 30 minutes, 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**

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 Manoa Graduate Division (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.
j. 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 the Graduate Division. 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. For current listing, visit: www.hawaii.edu/graduate/wa/selectmember.php.

Approval of Dissertation Topic
The department’s guideline is that approval of the dissertation topic will result from the 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**

Deadlines are within the first month of each semester (including summer). Visit www.hawaii.edu/graduatedownload/forms/miscellaneous/gradapp.pdf.

**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 Graduate Division 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 defendable; 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)**

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 the Graduate Division. 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 Graduate Division, 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 Graduate Division 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 Graduate Division’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 Graduate Division'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**

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**

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 Graduate Division 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 the Graduate Division.

**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)
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**

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<thead>
<tr>
<th>FORM</th>
<th>TASK</th>
<th>NORMAL PROGRESS</th>
<th>YOUR PROGRESS</th>
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<tbody>
<tr>
<td>I.</td>
<td>Preliminary Conference</td>
<td>1\textsuperscript{st} semester</td>
<td></td>
</tr>
<tr>
<td>I.</td>
<td>Qualifying Examination</td>
<td>Beginning of 2\textsuperscript{nd} semester</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Admission to Candidacy</td>
<td>3\textsuperscript{rd} 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>Results of Comps. Exam</td>
<td>4\textsuperscript{th} semester</td>
<td></td>
</tr>
<tr>
<td>II.</td>
<td>Approval of Doctoral Committee</td>
<td>4\textsuperscript{th} semester</td>
<td></td>
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<tr>
<td>II.</td>
<td>Approval of Dissertation Topic</td>
<td>5\textsuperscript{th} semester</td>
<td></td>
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<tr>
<td>III</td>
<td>Dissertation Defense (final exam)</td>
<td>8\textsuperscript{th} – 10\textsuperscript{th} semester</td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>Dissertation Approval</td>
<td>8\textsuperscript{th} – 10\textsuperscript{th} semester</td>
<td></td>
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</table>

**With MS in geological field**

<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>1\textsuperscript{st} semester</td>
<td></td>
</tr>
<tr>
<td>I.</td>
<td>Admission to Candidacy</td>
<td>2\textsuperscript{nd} 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\textsuperscript{nd} semester</td>
<td></td>
</tr>
<tr>
<td>II.</td>
<td>Approval of Doctoral Committee</td>
<td>2\textsuperscript{nd} semester</td>
<td></td>
</tr>
<tr>
<td>II.</td>
<td>Approval of Dissertation Topic</td>
<td>3\textsuperscript{rd} semester</td>
<td></td>
</tr>
<tr>
<td>III.</td>
<td>Dissertation Defense (final exam)</td>
<td>6\textsuperscript{th} semester*</td>
<td></td>
</tr>
<tr>
<td>IV.</td>
<td>Dissertation Approval</td>
<td>6\textsuperscript{th} semester *</td>
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*The Graduate Studies Committee may under some circumstances consider the 8th semester to be normal progress.

** GG Department Forms
AREA REQUIREMENTS

HIGH-PRESSURE GEOPHYSICS AND GEOCHEMISTRY

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

A. Basic:
   - GG 301  Mineralogy and lab
   - GG 302  Igneous and Metamorphic Petrology
   - GG 304 or GG 450  Physics of the Earth and Planets or Geophysical Methods
   - MATH 241-242  Calculus I, II
   - MATH 243-244  Calculus III, IV
   - PHYS 170-170L  General Physics I and lab
   - PHYS 274  General Physics III
   - CHEM 351  Physical Chemistry I
   - CHEM 352  Physical Chemistry II

B. Additional for the area: At least four courses in category 1. ● = GG courses taught in the last two years.

1. Geology and Geophysics
   ● GG 312  Geomathematic
   ● GG 325  Geochemistry
   ● GG 600  Equations in Geophysics
   ● GG 602  Theoretical Petrology
   ● GG 603  Petrology of Ocean Lithosphere
   ● GG 608  Isotopes and Trace Elements
   ● GG 701  Physics of the Earth's Interior
   GG 703  Fractures and Faults

2. Optional Related Courses
   a. Geology and Geophysics
      ● GG 642  Elemental Composition Changes
      ● GG 681  Continuum Mechanics
   b. Physics
      PHYS 400  Applications of Mathematics in Physical Science
      PHYS 430  Thermodynamics and Statistical Mechanics
      PHYS 440  Solid State Physics I
      PHYS 785  Solid State Theory
   c. Chemistry
      CHEM 422  Intermediate Inorganic Chemistry
      CHEM 601  Theory of Chemical Bonding
      CHEM 602  Chemical Applications of Spectroscopy
      CHEM 651  Chemical Thermodynamics & Statistical Mechanics
      CHEM 658  Crystallography
d. Mathematics
   MATH 402    Partial Differential Equations I
   MATH 407    Numerical Analysis
   MATH 442    Vector Analysis

e. Mechanical Engineering
   ME 371      Mechanics of Solids
   ME 435      Experimental Methods in Materials Research and lab
   ME 474      Fundamental of Acoustics
   ME 671      Continuum Mechanics
HYDROGEOLOGY AND ENGINEERING GEOLOGY

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

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

B. Requirements for the area. For hydrogeology students: all courses from category 1, one or more courses from category 2, and one or more courses from categories 3, 4, and 5 combined. For engineering geology students: three or more courses from category 3, one or more courses from category 1, and two or more courses from categories 2, 4, and 5 combined. Especially desirable courses are underlined. • = GG courses taught in the last two years.

1. Hydrogeology Core:
   • GG 455 Hydrogeology and lab
   • GG 655 Groundwater Modeling
   • NREM 660 Hydrologic Processes in Soil and lab
   • CEE 424 Applied Hydrology OR
   • GEOG 405 Water in the Environment

2. Water Quality:
   • GG 325 Geochemistry
   • GG 425 Environmental Geochemistry
   • CEE 330 Environmental Engineering
   • CEE 635 Environmental Chemistry
   • CEE 644 Water Quality Modeling

3. Engineering Geology and Soils:
   • GG 300 Volcanology
   • GG 303 Structural Geology
   • GG 313 Geomathematics
   • GG 413 Geological Data Analysis I
   • GG 420 Coastal Geology
   • GG 450 Geophysical Methods
   • GG 451 Earthquakes
   • GG 455 Hydrogeology
   • GG 600 Equations of Geophysics
   • GG 685 Geophysical Inverse Theory
   • CEE 355 Geotechnical Engineering I
   • GEOG 403 Fluvial Geomorphology
   • GEOG 412 Environmental Assessment
4. Advanced Hydrology and Water Resources:
   CEE 422  Environmental Fluid Mechanics
   CEE 627  Groundwater Hydrology
   ME 625  Numerical Method in Fluid Mechanics and Heat Transfer

5. Other related courses:
   ● GG 691  Geological Data Analysis II
   CEE 320  Fluid Mechanics Fundamentals
   ME 311  Thermodynamics
   ● GG 681  Continuum Mechanics
   ME 672  Finite Element Analysis
   NREM 461  Soil and Water Conservation
   GEOG 470  Remote Sensing
   MATH 243-244  Calculus III, IV
   MATH 311  Introduction to Linear Algebra
   Certain other math, physics, soils, and engineering courses
MARINE GEOLOGY AND GEOBIOLOGY

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 250  Scientific Programming  
- 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, Geochemistry and Geobiology  
   - GG 301  Mineralogy  
   - GG 302  Igneous and Metamorphic Petrology  
   - GG 309  Sedimentology and Stratigraphy  
   - GG 325  Geochemistry  
   - 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, geobiology, biogeochemistry, 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 637  Macroevolution and Earth History  
   - ●GG 638  Earth System Science and Global Change  
   - ●GG 639  Stable Isotope Biogeochemistry  
   - ●GG 639  Coastal Geology  
   - ●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
PLANE TARY GEO S C IEN CES

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 460  Geological Remote Sensing
   - 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
   • GG 671B  Remote Sensing
   • GG 671C  Remote Sensing:

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

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.

● GG 600  Equations of Geophysics
● GG 681  Continuum Mechanics
GG 652  Gravity, Magnetics, and Heat Flow
● GG 650  Seismology
● GG 691 or GG 685  Geological Data Analysis II or Geophysical Inverse Theory
GG 701  Physics of the Earth's Interior
GG 703  Fractures and Faults
VOLCANOLOGY, GEOCHEMISTRY, AND PETROLOGY

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 supporting sciences of chemistry and physics 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)

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<thead>
<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>GG 200</td>
<td>Geological Inquiry</td>
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<tr>
<td>GG 304 or GG 450</td>
<td>Physics of the Earth and Planets or Geophysical Methods</td>
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<tr>
<td>GG 305</td>
<td>Geological Field Methods</td>
</tr>
<tr>
<td>GG 325</td>
<td>Geochemistry</td>
</tr>
<tr>
<td>MATH 241-242</td>
<td>Calculus I-II</td>
</tr>
<tr>
<td>PHYS 151-152 and Labs</td>
<td>College Physics I, II and labs (or PHYS 170-272 and Labs)</td>
</tr>
<tr>
<td>CHEM 161-162 and Labs</td>
<td>General Chemistry I, II and labs</td>
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</tbody>
</table>

B. Normally, a total of at least six courses from the first four categories below.

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 402 Hawaiian Geology
   - 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:

CHEM 274-274L  Principles of Analytical Chemistry
CHEM 351 and 352  Physical Chemistry I, II
CHEM 658   Crystallography
PHYS 274   General Physics III
PHYS 350   Electricity and Magnetism
PHYS 430   Thermodynamics and Statistical Mechanics
MATH 243-244  Calculus III, IV
MATH 311   Introduction to Linear Algebra
MATH 371  Elementary Probability Theory
OCN 631   Ocean Minerals
OCN 635   Isotopic Marine Geochemistry
CEE 320   Fluid Mechanics Fundamentals and lab
WHO'S WHO

Department Chair .............................................................................................................. Greg Moore
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 ............................................................................................ Evelyn Norris

Hawaii Institute of Geophysics and Planetology Director .................................................. 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/ovrld/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 700F 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 700F do not have a special tuition and fee rate. To enroll in GG 700F, download the application at www.hawaii.edu/graduate/download/forms/master/700f/pdf

**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/
Graduate Division - 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 Graduate Division. Some Graduate Division 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>
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<td>First Language Exam (Language: ________________________)</td>
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</table>

Signature of Graduate Chair ____________________________  Date ________________

GRADUATE DIVISION ACTION

☐ Approved  ☐ Not Approved  By ____________________________  Date ________________

Remarks

☐ Graduate Program

2640 Maili Way, Spalding Hall 352, Honolulu, Hawaii 96822
Telephone: (808) 956-8350
An Equal Opportunity/Affirmative Action Institution
Master's Plan A – Advance to Candidacy (Form II)

Part I. To be completed by the student

Name ____________________________ 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 729 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.

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<thead>
<tr>
<th>Name (Type or Print)</th>
<th>Signature</th>
<th>Date</th>
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<tbody>
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Part II. To be completed by the graduate chair

Exam Not Required MM/DD/YY Passed Failed

Second Language Exam (Language: ____________________________) ☑

Advance to Candidacy: ☐ Recommended ☐ Not Recommended

Signature of Graduate Chair ____________________________ Date ____________________________

GRADUATE DIVISION ACTION

☐ Approved ☐ Not Approved By ____________________________ Date ____________________________

Remarks

C: Graduate Program / Student

2540 Maile Way, Spalding Hall 352, Honolulu, Hawaii 96822
Telephone: (808) 956-8500
An Equal Opportunity/Affirmative Action Institution
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

Date of Final Oral Exam / Defense ____________________________

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.

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<tr>
<th>Name (Print or Type)</th>
<th>Signature</th>
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</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

2540 Malia Way, Spalding Hall 352, Honolulu, Hawaii 96822
Telephone: (808) 956-6000
An Equal Opportunity/Affirmative Action Institution
Master's Plan A – Thesis Submission (Form IV)

Part I. To be completed by the student

Name ___________________________ UH ID No. _______________________

Graduate Program ___________________________ Degree Objective ___________________________

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>
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</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: ___________________________.

PDF of dissertation received on: ___________________________.

Student Signature ___________________________

GRADUATE DIVISION ACTION

☐ Approved ☐ Not Approved By ___________________________ Date ___________________________

Remarks ___________________________

C: Graduate Program

3540 Male Hall Spalding Hall 310, Honolulu, Hawaii 96822
Telephone (808) 956-9550
An Equal Opportunity/Affirmative Action Institution
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. ___________________________

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/YYYY

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

<table>
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</tbody>
</table>

Exam | Not Required | MM/DD/YYYY | Passed | Failed
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General or Qualifying Exam | | | | |
General or Qualifying Exam (Repeat if failed the first time.) | | | | |
First Language Exam (Language: ___________________________) | ✓ | | | |

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
UNIVERSITY OF HAWAI‘I AT MĀNOA
School of Ocean and Earth Science and Technology
Department of Geology and Geophysics

Doctorate
Student Progress Form IB
Timeline of Comprehensive Examination

Student’s Name: ____________________________

Field of Study: G&G

Date

1. Department Chair’s approval of Form IA:
   ___________ (actual)
2. Examination Committee meeting:
   ___________ (actual)
3. Written questions given to Examination Chair:
   ___________ (planned)
4. Written exam (at least 4 months from the date of no. 2):
   ___________ (planned)
5. Answers given to examiners:
   ___________ (planned)
6. Comments given to student (within 1 day from the end of no. 4):
   ___________ (planned)
7. Oral exam (within 7 days from commencement of no. 4):
   ___________ (planned)

Names

1. Chairperson ____________________________
   2. Advisor ________________________________
   3. Member ________________________________
   4. Member outside student’s area of interest
   5. Member outside student’s area of interest

Signatures

   ____________________________
   ____________________________
   ____________________________
   ____________________________
   ____________________________

Student’s Signature ____________________________ Date ___________
Approved by Graduate Chair _______________________ Date ___________

1680 East-West Road, Honolulu, Hawaii 96822
Telephone: (808) 956-7640, Facsimile: (808) 956-5512
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**UNIVERSITY OF HAWAI‘I AT MĀNOA**
School of Ocean and Earth Science and Technology
Department of Geology and Geophysics

**Doctorate**

**Student Progress Form IC**
*Results of Comprehensive Examination*

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

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<th>Field or Area</th>
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Decision:  Pass ____  Conditional Pass ____  Fail ____

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

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**Names**  **Signatures**

1. Chairperson  ____________________________  ____________________________

2. Advisor  ____________________________  ____________________________

3. Member  ____________________________  ____________________________

4. Member outside student’s area of interest  ____________________________

5. Member outside student’s area of interest  ____________________________

Student’s Signature  Date  Approved by Graduate Chair  Date

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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.

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<td>University Representative</td>
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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

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<th>Exam</th>
<th>Not Required MM/DD/YY</th>
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<th>Failed</th>
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<td>Comprehensive Exam (oral or oral &amp; written)</td>
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<td>Comprehensive Exam (Repeat if failed the first time.)</td>
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<td>Second Language Exam (Language: ____________________________)</td>
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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
2540 Maile Way, Spalding Hall 352, Honolulu, Hawai‘i 96822
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UNIVERSITY OF HAWAI‘I AT MĀNOA

Graduate Division
Student Academic Services
Records Office

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:

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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
2540 Māile Way, Spalding Hall 352, Honolulu, Hawaii 96822
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Doctorate – Dissertation Submission (Form IV)

Part I. To be completed by the student

Name ___________________________ Last, First, M.L. ___________________________

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.

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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

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