REGULATIONS FOR THE POSTGRADUATE DIPLOMA IN EARTH SCIENCES (PGDES)

(See also General Regulations)

The Postgraduate Diploma in Earth Sciences is a postgraduate diploma awarded for the satisfactory completion of a prescribed course of study in Earth Sciences.

Admission requirements

ES1 To be eligible for admission to the courses leading to the Postgraduate Diploma in Earth Sciences, a candidate

(a) shall comply with the General Regulations; and

(b) shall hold

(i) a Bachelor's degree with honours of this University; or

(ii) another qualification of equivalent standard of this University or another University or comparable institution accepted for this purpose; and

(c) satisfy the examiners in a qualifying examination if required.

ES2 A candidate who does not hold a Bachelor's degree with honours of this University or another qualification of equivalent standard may in exceptional circumstances be permitted to register if the candidate can demonstrates adequate preparation for studies at this level and satisfies the examiners in a qualifying examination.

Qualifying examination

ES3

(a) A qualifying examination may be set to test the candidate's academic ability or his/her ability to follow the courses of study prescribed. It shall consist of one or more written papers or their equivalent and may include a project report.

(b) A candidate who is required to satisfy the examiners in a qualifying examination shall not be permitted to register until he/she has satisfied the examiners in the examination.

Award of diploma

ES4 To be eligible for the award of the Postgraduate Diploma in Earth Sciences (PGDES), a candidate

(a) shall comply with the General Regulations; and

(b) shall complete the curriculum and satisfy the examiners in accordance with the regulations set out below.

Length of curriculum

ES5 The curriculum of the part-time mode shall extend over not less than two academic years of part-time study and of the full-time mode over not less than one academic year. A candidate shall not be permitted to complete the curriculum in more than three academic years, except with the approval of the Faculty Board.

Completion of curriculum

ES6 To complete the curriculum, a candidate

(a) shall follow courses of instruction and complete satisfactorily all prescribed written, practical and field work; and

(b) shall satisfy the examiners in all prescribed written papers and in any prescribed oral or practical examination.

Examinations

ES7 An assessment of the candidate's coursework during his/her studies, including completion of written assignments and participation in field work or laboratory work, as the case may be, is taken into account in determining the candidate's result in each course.

ES8 A candidate who has failed to satisfy the examiners at his/her first attempt in courses totalling not more than half of the number of units of courses in the examination held during any of the academic years of study may be permitted to present himself/herself for re-examination in the course or courses at a specified subsequent examination, with or without repeating any part of the curriculum.

ES9 A candidate who is re-examined in any course shall not be eligible for the award of more than a pass grade in that paper.

ES10 A candidate who has failed to satisfy the examiners in any prescribed fieldwork or practical work may be permitted to present himself/herself for re-examination in fieldwork or practical work within a specified period.

ES11 Failure to take the examination as scheduled, normally results in automatic course failure. A candidate who is unable because of illness to be present at any examination of a course, may apply for permission to be present at some other time. Any such application shall be made on the form prescribed within two weeks of the examination.

ES12 A candidate who has failed to satisfy the examiners in more than half the number of units of courses in any to be examined during any of the academic years, or in any course at a repeated attempt; may be recommended for discontinuation for studies.

Examination results

ES13 At the conclusion of the examination, a pass list shall be published. A candidate who has shown exceptional merit at the whole examination may be awarded a mark of distinction, and this mark shall be recorded in the candidate's degree diploma.

Transfer of candidature into the Master of Science in the field of Applied Geosciences

ES14

(a) Subject to the approval of the Faculty Board, a candidate who has registered for the PGDES may be allowed to transfer to read the Master of Science in the field of Applied Geosciences and advanced credits of up to 30 units may be granted. Application for the transfer must be made prior to the BoE's recommendation for conferment of the PGDES, or before August 31 of the final year of PGDES, whichever is earlier.

(b) A candidate who has transferred his/her candidature to the Master of Science in the field of Applied Geosciences will not be awarded the PGDES. If a candidate after transferring to the Master of Science in the field of Applied Geosciences fails to complete the Master of Science, he/she may be awarded the PGDES provided that he/she has satisfied the requirements of the PGDES.

SYLLABUSES FOR THE DEGREE OF POSTGRADUATE DIPLOMA IN EARTH SCIENCES (PGDES)

A. COURSE STRUCTURE

	Core Courses (18 units)
GEOS7010	Geology - Principles and Practice (6 units) ***OR***
GEOS7023	Geology for Geotourism (6 units)
GEOS7011	Advanced Geology of Hong Kong (6 units)
GEOS7025	Geological Fieldwork for Geotourism (6 units) ***OR***
GEOS7021	Geological Fieldwork I (3 units) ***AND***
GEOS8021	Geological Fieldwork II (3 units)
	Elective Courses (12 units)
GEOS7026	Introduction to Environmental Geology (3 units)
GEOS7027	Earth Systems (6 units)
GEOS7028	Foundation Course in Earth Sciences (6 units)
GEOS7029	Earth's climate past and future (3 units)
GEOS7030	Earth, environment and society (6 units)
GEOS7031	Earth through time (6 units)
GEOS7032	Introduction to atmosphere and oceans (3 units)
GEOS8202	Development and management of mineral resources (3 units)
GEOS8207	Global Climate (6 units)
GEOS8208	Climate Change and the Environment (6 units)
GEOS8209	Climate Change and Society (6 units)
GEOS8210	A cool world: ice ages and climatic changes (6 units)
GEOS8211	Earth Observations and Remote sensing (6 units)
GEOS8212	Earth-ocean-atmosphere interactions (6 units)
GEOS8213	Global Tectonics (6 units)
GEOS8214	Structural Geology (6 units)
GEOS8215	Sedimentology (6 units)
GEOS8216	Physical Oceanography (6 units)
GEOS8217	Introduction to Climatology (3 units)
GEOS8218	Meteorology (6 units)
GEOS8219	Igneous and metamorphic petrology (6 units)
GEOS8220	Mineralogy and geochemistry (6 units)

Certain courses not included in the list above may be accepted as alternative electives at the discretion of the programme director.

Timetabling of courses may limit availability of some elective courses.

B. COURSE CONTENTS (Provisional)

GEOS7010 Geology principles and practice (6 units)

A review of fundamental concepts in geoscience, including earth and geological processes, surface processes, minerals and rocks, geological structures and geological map interpretation. The course also introduces the rocks and geological formations of Hong Kong.

GEOS7011 Advanced geology of Hong Kong (6 units)

This advanced course examines specialist aspects of the rocks and geological formations and structures of Hong Kong and their significance in the context of geotechnical engineering, environmental management and resource development. Topics include volcanic and granitic rocks, sedimentary and metamorphic rocks, weathering processes, superficial deposits, geology and geological aspects of landslides.

GEOS7021 Geological fieldwork I (3 units)

Self-directed study in the field over a 12-month period leading to the production of maps, field sheets, narrative accounts and other geological records for assessment. The fieldwork may be undertaken in association with the excursions of the Department of Earth Sciences, the local learned societies or independently. (Marked on a pass/fail basis.)

GEOS7023 Geology for geotourism (6 units)

This will be a joint course with GEOS7010 Geology - Principles and Practice (6 units)

GEOS7025 Geological fieldwork for geotourism (6 units)

Self-directed study in the field over a 18-month period leading to the production of maps, field sheets, narrative accounts and other geological records for assessment. The fieldwork may be undertaken in association with the excursions of the Department of Earth Sciences, the local learned societies or independently. (Marked on a pass/fail basis.)

GEOS7026 Introduction to environmental geology (3 units)

A course of Directed Studies that will be decided individually by the course coordinator. The course will include tuition, reading and assignments. The course provides an introduction to some aspects of Environmental Geology.

GEOS7027 Earth systems (6 units)

To provide students who have a fundamental background in Earth Sciences with a more in-depth appreciation of the Earth System and the interfaces between its component parts, in order that they might appreciate how informed decisions can be made on the future exploitation and preservation of the planet. To provide a forum for discussion of global issues facing earth scientists.

GEOS7028 Foundation course in earth sciences (6 units)

The course, intended for students taking their first course in earth science, provides a basic overview of the earth’s structure, material and internal and external processes.

GEOS7029 Earth’s climate past and future (3 units)

An introduction to the study of climate change in the geological record. We look at research methods used in paleoclimatic and paoeoenvironmental reconstruction and discuss how such information can be used to model possible climate trends, such as global warming.

GEOS7030 Earth, environment and society (6 units)

An introduction to global environment and issues and how the environment affects the well-being of a society. The course will cover natural and anthropogenic causes of environmental changes, climate change, biochemical cycles, fossil fuel and alternative energies, air water & solid wastes and issues in land use planning.

GEOS7031 Earth through time (6 units)

The course aims to introduce the concepts of geological time and uniformitarianism. It will provide an understanding of the fossil record and the integration of earth systems and plate tectonics. Students will gain an appreciation of our place in the Universe and an understanding of the evolution of Earth and of life on Earth through time.

GEOS7032 Introduction to atmosphere and oceans (3 units)

The course will introduce the physical structure of the oceans and the atmosphere and explain their interaction and its significance for surface meteorology and global climate change. The role of humans on global systems will be identified and discussed.

GEOS8021 Geological fieldwork II (3 units)

Self-directed study in the field over a 6-month period leading to the production of maps, field sheets, narrative accounts and other geological records for assessment. The fieldwork may be undertaken in association with the excursions of the Department of Earth Sciences, the local learned societies or independently. (Marked on pass/fail basis.)

GEOS8202 Development and management of mineral resources (3 units)

To provide students with knowledge about the classification of mineral deposits and their basic features; to understand the processes that lead to their formation; to gain hands-on experience with mining procedures. Contents: concepts in mineral deposits and mining industry; exploration and mining methods, classification of mineral deposit, mineral deposit models, magmatic oxide and sulfide deposits, skarn deposits, porphyre deposits, coal, oil and gas, resource evaluation.

GEOS8207 Global climate (6 units)

Processes in the oceans and atmosphere. Heating the system, development of ocean currents, winds, clouds, and resources. Effects of coupling, climate change, pollution. Atmospheric structure and composition, Global ocean and atmospheric circulation patterns, El Niño-La Niña and case studies of ocean-atmosphere feedback, formation of winds, storms and ocean currents.

GEOS8208 Climate change and the environment (6 units)

The Quaternary Period comprises the last 2.6 million years of Earth history, an interval dominated by climate fluctuations and the waxing and waning of large northern hemisphere ice sheets. This course will cover the many types of evidence used to reconstruct ocean and atmospheric conditions through the Quaternary.

GEOS8209 Climate change and society (6 units)

This course will explore the role of humans in global change and the environmental responses to such changes. It will also take a look at human evolution and migration from a paleoenvironmental perspective.

GEOS8210 A cool world: ice ages and climatic changes (6 units)

This course sets out to provide students with an understanding of how dynamic Earth is and how it has changed over the past 2.5 million years. The Quaternary Period comprises the last 2.6 million years of Earth history, an interval dominated by climate fluctuations and the waxing and waning of large northern hemisphere ice sheets. This course will cover the many types of geologic evidence, from glacial geomorphology to deep-sea geochemistry, that are used to reconstruct ocean and atmospheric conditions (e.g., temperature) through the Quaternary. We will also consider recent non-glacial deposits and landforms, including coastal features, but the general emphasis is on how the landscape has evolved within the context of Late Quaternary climate variability.

GEOS8211 Earth observations and remote sensing (6 units)

This course will provide an introduction to the theory and techniques of remote sensing and GIS in Earth and Planetary Observation, and introduces the theory and techniques of remote sensing and their application to environmental analysis. Remote sensing deals with the acquisition of information using techniques that do not require actual contact with the object or area being observed. Examples of remotely sensed data include aerial photography, infrared thermometry, and passive microwave sensing.

GEOS8212 Earth-ocean-atmosphere interactions_ (6 units)

To examine the complex interactions between geosphere, hydrosphere and atmosphere. Processes in the oceans and atmosphere, hydrothermal systems: mineral exploration & biospheric evolution, ocean atmosphere interface and radiation budgets; evolution of ocean currents, winds, clouds, effects of coupling, climate change. Atmospheric structure and composition, global ocean and atmospheric circulation patterns.

GEOS8213 Global tectonics (6 units)

This course is intended to provide students with an understanding of the driving forces of Earth processes and the global outcome of these processes through an examination of direct and indirect observations, the evolution of hypotheses, and critical thinking.

GEOS8214 Structural geology (6 units)

The course covers the mechanical properties of rocks and how they are deformed, geological maps and their use in interpreting structure. Topics which may be covered include: Stress-strain relationships; use of Mohr Circles, earthquakes, big faults, fault rocks; thrusts; folds; textures, kinematic indicators and strain analysis; Shear zones; extensional faulting; basins; strike-slip faults; joints; deformation mechanisms. Practical classes will look at the use of stereonets; theoretical maps, real maps and an introduction to stereograms. These sessions will be both quantitative and descriptive.

GEOS8215 Sedimentology (6 units)

The course deals with sedimentary rocks and processes. Contents include some of the following: Physical properties of sediments; processes of weathering, transportation and deposition; sedimentary rocks, carbonates, siliclastic sediments, and sandstone petrography; diagenesis; sedimentary environments and facies; sedimentation and tectonics; geological record of environments through time.

GEOS8216 Physical oceanography (6 units)

To investigate oceans and their dynamics and the processes which have shaped them. Ocean composition and movement, waves, tides, beaches, interactions with the atmosphere and human exploitation of the non-living resources. To demonstrate how various physical elements of the marine environment interrelate to help form the ocean system.

GEOS8217 Introduction to climatology (3 units)

The course provides a basic overview of the earth's global weather system, processes that control the temporal and spatial variations in earth's climate. Students are expected to be able to identify major aspects of climatology and approaches to climatological study, explain the factors and physical processes controlling climate system, read synoptic charts and explain reasons for particular climatic conditions, understand the factors at work to modify micro-climates, especially of Hong Kong, and appraise the complexity of climate-related issues and the difficulty in discerning natural and human-induced global climatic changes.

GEOS8218 Meteorology (6 units)

The course is a survey of the earth's atmospheric structure and its behaviour, instrumental observation, application of remote sensing to meteorological studies, weather elements and weather systems.

GEOS8219 Igneous and metamorphic petrology (6 units)

The course provides a comprehensive treatment of the principles and techniques used in the study of igneous and metamorphic rocks and rock-forming processes. It covers petrogenesis, magmas and magmatic differentiation, igneous petrography, intrusive and extrusive rock suites, metamorphic processes & reactions and metamorphic facies and metamorphic petrography.

GEOS8220 Mineralogy and geochemistry (6 units)

The course provides students with an appreciation of mineralogical principles as a basis for understanding the petrography of igneous, sedimentary and metamorphic rocks. Its contents include the properties of minerals in hand specimen and thin section, the optical properties of minerals and the polarizing microscope and the characteristics of the major rock-forming minerals.