PRINCIPAL SUBJECT AREA

GEOLOGY

400 LEVEL COURSES

GL 401 Applied Hydrogeology (2 credits)

Recommended Texts:

GL 402 Soils and Quaternary Geology (2 credits)
Soils as a product of the natural environment with focus on formative processes and classification. Soil conservation; The soils of Sri Lanka; Major events and the significance of the Quaternary period with special reference to Quaternary Geology of Sri Lanka.

Recommended Texts:

GL 403 Precambrian Geology (2 credits)

Recommended Texts:

GL 404 Isotope Geology (2 credits)
Isotopes - stable and radioactive, stable isotope fractionation, stable isotopes in the lithosphere, hydrosphere and biosphere and the mantle and their applications in geology. Radioactive isotopes, their decay schemes and use in isotopic dating of minerals and rocks and inference of geological history of earth materials.

Recommended Texts:

GL 405 Applied Geophysics (2 credits)
Principles of applied geophysics. Investigations of earth resources and geologic structures by Geophysical methods, Seismic Surveying, Gravity Surveying, Magnetic Surveying, Electrical Surveying, Electromagnetic surveying, Bore hole geophysics.

Recommended Texts:
GL 406 Oceanography and Coastal Geomorphology (3 credits)

Recommended Texts:

GL 407 Surveying and Levelling (2 credits)

Recommended Texts:

GL 408 Energy Resources (1 credit)

GL 409 Advanced Metamorphic Petrology (3 credits)
(Prerequisite: GL 312)
Principles and application of thermodynamics to mineral equilibrium in metamorphic rocks. Quantitative approaches in metamorphic petrology. Geothermometry and Geobarometry. Principles and application of the P-T-t path concept. P-T-t path case studies, P-T-t path determination using compositional zoning in minerals. Laboratory study of P-T-t history of metamorphic terrain using mineral reactions and reaction textures in thin sections. Introduction to experimental petrology

Recommended Texts:

GL 411 Structural Geology and Tectonics (2 credits)
Crystall defects and deformation mechanisms. Concept of strain ellipse and ellipsoid. Ductile structures such as foliations, lineations, folds, boudins and shear zones. Mmechanism(s) of their formation. Folding, elements of fold style and fold mechanism. Introduction to structural geology and tectonics of Sri Lanka. Geodynamic evolution of Sri Lanka. Plate tectonics in detail. Concept of formation and break-up of supercontinents. Tectonics in the Indian Ocean region. Study of microscopic to megascopic structures and related fabrics in the field for practical classes. Lectures have to be supplemented by preparations of essays and seminar presentations by students.

Recommended Texts:
GL 412 Mineral Exploration and Mining Geology (2 credits)
Methods of exploration and mining geology, including mapping, geophysics, remote sensing, exploration geochemistry, inclusion studies and diamond drilling. Technical and economic aspects of exploration programme design and reserves evaluation procedures. Open cast mining, underground mining, mining in the soft ground, underwater and deep sea.

Recommended Texts:

GL 413 Advanced Igneous Petrology (3 Credits)
(Prerequisite: GL 314)
Application of phase diagrams, experimental petrology, and field and petrographic relationships to the origin of magmas. Layered intrusions, Ophiolite complex, Igneous processes and global tectonics field trips. Petrographic studies on layered rocks, associations and ophiolite complexes.

Recommended Texts:

GL 414 Advanced Environmental Geology (2 credits)
(Prerequisite: GL 306)
Natural environment, particularly geologic factors that may impact upon human life or way of life, Environmental problems and possible alternative solutions to such problems. The biogeochemical cycles of water, carbon, nitrogen, and sulfur; the interactions among major biogeochemical cycles and resultant global change. Health and disease, waste disposal, water, mineral and energy resources and conservation, land reclamation, land-use planning.

Recommended Texts:

GL 415 Environmental Geochemistry (2 credits)
(Prerequisite: GL 207)
Geochemistry of ecosystems; Heavy metal pollution; sources and origins of heavy metals in the environment; mobility and immobility of heavy metals in environmental media; bioaccumulation; Dose-response relationships, toxic elements and elemental forms; Medical geochemistry; Geochemical health problems pertaining to Sri Lanka.

Recommended Texts:
GL 417 Geologic and Hydrologic Hazards (Prevention and Mitigation) (2 credits)


Recommended Texts:

GL 418 Advanced Engineering Geology (2 credits)
(Prerequisites: GL 203, GL 307)


Recommended Texts:

GL 419 Petroleum Geology and Exploration (1 Credit)


Recommended Texts:

GL 420 Advanced GIS (2 credits)
(Prerequisite: GL 316)


Recommended Texts:

GL 421 Project Proposal and Report Writing (1 credit)

Research Project, EIA, Budget estimation, Writing scientific papers and reports

Recommended Texts:

GL 422 Seminar on Special Topics in Geology (1 credit)

A structured program of reading and seminars leading to an in-depth understanding of a chosen topic in geology. Students may repeat course once for an additional two or three credits
GL 423 Research Project (6 credits)
Field/Laboratory studies on a problem of current geological interest. A detailed report has to be submitted incorporating objectives, methodology, results, interpretation, conclusions and bibliography. An oral examination based on the project will be held as part of this course. The candidate will have to make a summary presentation of the project at this oral examination conducted by a panel of Senior teachers/researchers.

GL 424 Field Geology Assessment (2 credits)
Each student is required to individually prepare a detailed geological/structural map of a given area and submit a report, and may be required to make an oral presentation, on the basis of his/her study. The report (and the presentation) shall consist of laboratory studies pertaining to the area in addition to the field observations. The map and the report will be assessed and graded. A student is required to spend at least a minimum of 90 hours to complete the field work component of this assessment.

GL 427 Seismology (2 credits)
Seismic waves and earth models, Seismic sources and source parameters, Seismic signals and noise, Seismic sensors and recording systems, Site selection, preparation and installation of seismic stations, Seismic networks and arrays, Seismic data formats archival and exchange, Data analysis and interpretation, Seismic hazard assessment.

Recommended Texts:

GL 428 Advanced Sedimentary Petrology (3 credits)
(Prerequisite: GL 317)
Introduction-basic concepts and methodology; siliciclastic sediments- sandstones and sandstone diagenesis, conglomerates, breccia, mud rocks; chert and siliceous sediments. Carbonate sediments and limestones- carbonate diagenesis and microfabrics; dolomitization and dedolomitization; Evaporites and sequences; sedimentary ironstones and iron formations Phanerozoic and the Precambrian; sedimentary phosphate deposits, nodular and bedded phosphorite, bioclastic and pebble bed phosphorites, Guano phosphorites; geology of fluvial deposits, coal, oil shale and petroleum, petroleum source rocks; volcaniclastic sediments; origin and mineralogy of clays.

Recommended Texts:
2. Carbonate microfabrics by R.Rezak and D.L. Lavoie Springer Verlag 1990
6. Origin and Mineralogy of Clays by B.Velde Springer Verlag 1995