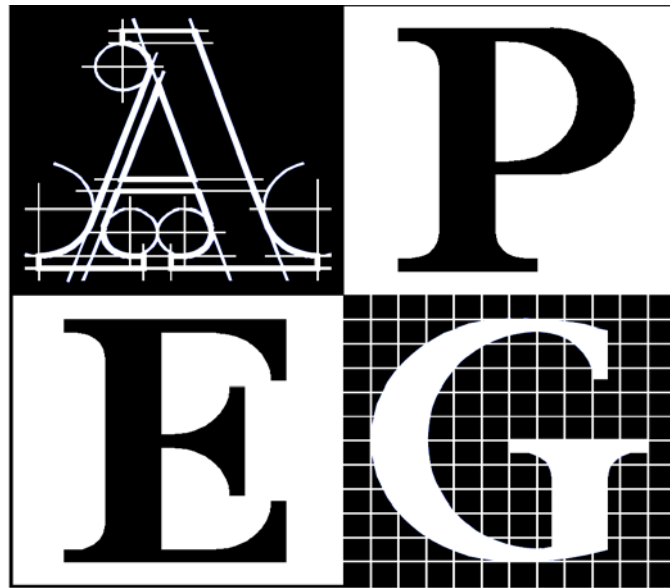


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# ***GEOLOGY***

# ***UNIFORM SYLLABUS***

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**Professional Engineers  
and Geoscientists of BC**

**w w w . a p e g . b c . c a**

**The Association of Professional Engineers and  
Geoscientists of the Province of British Columbia**

- Note:**
- 1. This Syllabus May Be Subject To Change**
  - 2. These Courses Are Required In Addition To The Courses Required In The Common-To-All Uniform Syllabus**

**The current geoscience syllabi will be replaced by new syllabi on January 1, 2007. Individuals applying for registration before this date will have their choice of the current or new syllabi. Individuals applying for registration after this date will have their applications evaluated with respect to the new syllabi.**

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## **GEOLOGY NEW SYLLABUS – Group A (6 of 7 Required)**

### **COMPULSORY COURSES.**

#### ***06-GL-A1. Introduction to Geomorphology.***

The processes and principles of landform development and distribution. Introduction to air photo interpretation and terrain analysis in land development and resource applications.

#### ***06-GL-A2. Introduction to Geochemistry.***

Origin, distribution and cycles of elements in the Earth. Evolution of the ocean and atmosphere. Low temperature aqueous solution geochemistry.

#### ***06-GL-A3. Introduction to Applied Geophysics.***

Instrumentation, application and limitations of gravity, magnetic, electromagnetic, electrical, acoustic and seismic methods in the exploration for mineral and energy resources and in engineering applications. survey navigation.

#### ***06-GL-A4. Introduction to Palaeontology.***

Description, classification and identification of fossils and their application to stratigraphy sedimentology and tectonics.

*Recommended Text:*

*Bringing Fossils to Life: An Introduction to Paleobiology, Donald Prothero, 2nd Edition.*

#### ***06-GL-A5 / A6 / A7. Any two of Igneous Petrology, Metamorphic Petrology or Sedimentary Petrology.***

**Igneous Petrology:** Applications of physical and chemical principles to the origin and occurrence of igneous rocks. Crystallisation from silicate magmas, heat transfer and mineral phase equilibria.

**Metamorphic Petrology:** Nature and origin of common metamorphic rocks, heat flow during metamorphism, partial melting, metamorphic and metasomatic phase equilibria.

**Sedimentary Petrology:** Description and interpretation of ancient and modern sediments. Origin, depositional environment, composition, textures, diagenesis and geochemistry of clastic, carbonate and chemical sediments. Introduction to basin analysis.

#### ***06-GL-A8. Regional Geology.***

Overview of geologic features on a regional to global scale incorporating data and concepts from plate tectonics, stratigraphy, palaeontology, igneous, metamorphic and sedimentary petrology. Synthesis of the geologic history of a large area.

## **GEOLOGY NEW SYLLABUS – Group B (1 of 1 Required)**

### **COMPULSORY Course**

#### ***06-GL-B1. Field Work.***

A minimum of 12 days of actual field work done under academic supervision as part of a university curriculum.

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## **GEOLOGY NEW SYLLABUS – Group C (9 of 31 Required)**

### **ELECTIVE COURSES.**

#### ***06-GL-C1. Advanced Mineralogy.***

The crystal chemistry of minerals; x-ray diffractometry, scanning and transmission electron microscopy, electron microprobe analysis and spectrometric methods applied to the characterisation of minerals.

#### ***06-GL-C2. Igneous Geology.***

Detailed study of igneous rocks and the physical and chemical aspects of magma generation, evolution, emplacement and deposition. Interpretation of igneous rock facies and depositional environments.

#### ***06-GL-C3. Metamorphic Geology.***

Detailed study of metamorphic rocks. Physical and chemical aspects of metamorphism. Mineral assemblages, mineral compositions. Thermodynamics.

#### ***06-GL-C4. Sedimentary Geology.***

Detailed study of sedimentary rocks including facies concepts and characteristics. Palaeoenvironmental interpretation of sedimentary sequences. Diagenesis. Basin structure and stratigraphy.

#### ***06-GL-C5. Advanced Structure and Tectonics.***

Analysis and interpretation of natural deformation. Tectonic history. Field mapping and graphical data processing of structural fabrics and strain indicators. Kinematic and dynamic interpretation.

#### ***06-GL-C6. Advanced Geomorphology.***

One or more of the following topics. Fluvial geomorphology; flow and sediment transport in river channels, river morphology and fluvial sedimentation. Hillslope geomorphology; geomorphic events on slopes and slope evolution over long periods. Coastal geomorphology; waves and

tides, nearshore currents and sediment transport, shoreline configuration. Glacial geomorphology; Snow, ice, frost, mechanical properties and deformation of snow and ice, avalanches, properties of frozen ground, geomorphological phenomena in frozen ground especially in permafrost.

**06-GL-C7. *Advanced Palaeontology.***

The geological impact of life forms, biostratigraphy, palaeobiogeography, numerical taxonomy and evolution, fossilization processes.

**06-GL-C8. *Advanced Geochemistry.***

Any advanced course in geochemical principles or methods.

**06-GL-C9. *Advanced Geophysics.***

Advanced techniques in geophysical data acquisition and interpretation, including the theoretical bases. Physical properties of earth materials; potential field methods; basic inversion techniques; time sequence analysis.

**06-GL-C10. *Mineral Deposits.***

Mode of occurrence, distribution, genesis, evaluation and exploration for metallic and industrial mineral deposits. Includes ore petrology and geochemistry as well as theory of ore deposition in hydrothermal systems.

**06-GL-C11. *Ore Petrology.***

Mineralogy of ore deposits using optical microscopy and electron beam techniques.

**06-GL-C12. *Mining Evaluation.***

Conventional and geostatistical methods of ore reserve estimation and mine valuation. Analysis and presentation of capital and operating costs for ventures in the mineral industry. Policies, concepts and effects of Canadian mineral taxation systems.

**06-GL-C13. *Petroleum Geology.***

Origin, geochemistry and distribution of petroleum. Principles of exploration, evaluation and development of petroleum reservoirs and unconventional sources of petroleum.

**06-GL-C14. *Reservoir Evaluation.***

Multiphase movement of fluid in porous media and the petrophysics of reservoir rocks relative to the recovery of oil and gas reservoirs. Emphasis on petrophysics and those geological attributes of reservoirs which influence hydrocarbon recovery.

**06-GL-C15. *Coal Geology.***

Origin, composition and distribution of coal deposits. Methods of coal exploration; coal petrology and determination of coal quality.

**06-GL-C16. *Industrial Minerals.***

The origin, occurrence, exploration, evaluation, extraction, preparation and uses of industrial minerals and rocks, with particular reference to glaciated terrain.

**06-GL-C17. Quaternary Geology.**

Glacial processes and deposits, properties of glacial sediments and stratigraphy; landscape development during the Quaternary era, emphasising the history of glaciation; glacial geomorphology; applications of geomorphological information in resource development and land management.

**06-GL-C18. Hydrogeology.**

Theory of groundwater flow; flow nets; regional groundwater resources evaluation; role of groundwater in geologic processes; well hydraulics; groundwater chemistry and sources of contamination.

**06-GL-C19. Groundwater Contamination.**

Introduction to principles of groundwater chemistry; chemical evolution in natural groundwater flow systems; sources of contamination; mass transport processes; hydrochemical behaviour of contaminants; hazardous waste disposal in the terrestrial environment.

**06-GL-C20. Marine Geology.**

Morphology and plate tectonics of ocean basins, processes at mid-ocean ridges, seamount chains, relations between oceanic circulation and sediments, continental margins.

**06-GL-C21. Introduction to Soil Science.**

Physical, chemical and biological properties of soils; weathering and soil formation; principles of identification; classification; nature and distribution of major kinds of soils.

**06-GL-C22. Engineering Geology.**

Applications of the principles and techniques of geology, geophysics, soil mechanics, rock mechanics and hydrology at engineering sites; analysis of projects and problems on a local and regional scale; case histories.

**06-GL-C23. Environmental Geology.**

Applications of geoscience to problems created by man's occupancy and exploitation of the physical environment. Emphasis on geological opportunities and constraints in exploiting, managing and protecting surface and groundwater; containment of solid and liquid wastes; limiting exposure to hazardous earth materials and to destructive geologic processes.

**06-GL-C24. Computer Applications in Geoscience.**

Applications of mathematical modelling and geostatistical procedures to practical problems with a geoscience context

**06-GL-C25. Geographic and Spatial Data Analysis.**

Theory and principles of Geographic Information System design. Creation and storage of geoscientific databases. Manipulation, analysis and interpretation of spatially distributed geoscience information.

**06-GL-C26. *Remote Sensing of the Earth's Surface.***

Electromagnetic spectrum, principles of remote sensing at optical and other wavelengths; interpretation of geoscientific information from satellite and air photo images; image rectification.

**06-GL-C27. *Aerial Photo. Interpretation.***

Principles of stereoscopic imaging; identification of landforms, surface materials and processes, and geological structures from aerial photographs; measurements using the parallax principle, introduction to photogrammetry; principles of image rectification. Must include substantial practice in air photo interpretation.

**06-GL-C28. *Advanced Course in Geoscience.***

An advanced course in Geoscience acceptable for a degree in Earth Science.

**06-GL-C29. *Advanced Course in Geoscience.***

An advanced course in geoscience acceptable for a degree in Earth Science.

**06-GL-C30. *Thesis in Geoscience.***

**06-GL-C31 *GL-A1, A2, A3, A4, A5, A6, A7, A8 not used above***

Candidates who have taken all the courses in 06-GL-COMPULSORY (6 of 8 Required) can use the extra course here.