



## APGO Minimum Knowledge (Academic) Requirements

April 2009

The basic unit utilized in a knowledge requirement assessment is an education unit or EU. Each EU may only be utilized once in an assessment.

One EU is defined as formal instruction equivalent to a one-semester (13-week or 0.5 credit) course in a typical Bachelor of Science or Baccalaureate Degree (B.Sc.) in geoscience at a Canadian university. For example, one EU could consist of three hours of lectures or equivalent per week, with or without a lab component (lab components are not utilized as an EU during evaluation), for 13 weeks. An EU can be considered to be the equivalent of one three-credit-hour course in a 120-credit hour, four-year degree program.

The following is a summary of the knowledge requirements that are detailed in the next 4 pages:

- 1A - Compulsory Foundation Science (3 EUs)
- 1B - Additional Foundation Science (6 EUs)
- 2A - Compulsory Foundation Geoscience (4 EUs)
- 2B - Additional Foundation Geoscience (5 EUs)
- 2C - Other Geoscience/Science (9 EUs)

**Note:** EUs for sections 1A and 1B must be a first year or higher university level course acceptable for credit towards a degree in science, applied science or engineering. Remedial secondary school level courses, such as algebra, chemistry, geometry, physics or trigonometry will not be accepted.

**Note:** EUs for sections 2A, 2B, and 2C must be a second year or higher university level course acceptable for credit towards a degree in science, applied science or engineering. All courses must be credited and a mark received. Audited courses will not be accepted.

**Note:** For sections 2B and 2C the representative streams are not exclusive as professional geoscientists in Ontario are not registered into or by specialties. Content may be found in any of the streams. Please note that certain streams do have specific requirements that must be met. These requirements are noted in the tables on the following pages.

Recommended Requirements	Geology	Course #	Environmental Geoscience	Course #	Geophysics	Course #
<b>1A Compulsory Foundation Science *</b> (Total 3 EUs - 1 in each area required)	Chemistry		Chemistry		Chemistry	
	Math (Calculus)		Math (Calculus)		Math (Calculus)	
	Physics		Physics		Physics	
	<b>Total EUs 1A:</b>		<b>Total EUs 1A:</b>		<b>Total EUs 1A:</b>	
<b>1B Additional Foundation Science*</b> (Total 6 EUs - No more than 2 EUs in any of the six subject areas)	Biology		Biology		Biology	
	Computer Programming		Computer Programming		Computer Programming	
	Chemistry		Chemistry		Chemistry	
	Mathematics		Mathematics		Mathematics	
	Physics		Physics		Physics	
	Statistics		Statistics		Statistics	
	<b>Total EUs 1B:</b>		<b>Total EUs 1B:</b>		<b>Total EUs 1B:</b>	
<b>2A Compulsory Foundation Geoscience</b> (Total 4 EUs - 1 in each area required)	Field Techniques		Field Techniques		Field Techniques	
	Mineralogy and Petrology		Mineralogy and Petrology		Mineralogy and Petrology	
	Sedimentation and Stratigraphy		Sedimentation and Stratigraphy		Sedimentation and Stratigraphy	
	Structural Geology		Structural Geology		Structural Geology	
	<b>Total EUs 2A:</b>		<b>Total EUs 2A:</b>		<b>Total EUs 2A:</b>	
<b>2B Additional Foundation Geoscience</b> (Total 5 EUs - Geology and Environmental Science require a minimum of 1 and at most 2 from each sub-group, but no more than one in each subject; Geophysics requires 1 EU from 5 of the sub-groups). Sub-groups are separated by thick black line.	Geochemistry		Geochemistry		Digital Signal Processing	
	Geophysics		Geophysics		Global Geophysics / Physics of the Earth	
	Igneous Petrology		Hydrogeology or Hydrology		Seismology / Seismic Methods	
	Metamorphic Petrology		Engineering Geology		Exploration Geophysics	
	Sedimentary Petrology				Radiometrics / Gravity & Magnetics	
	Sedimentology		Geomorphology or Soil Science		Electrical & Electromagnetic Methods	
	Glacial Geology or Geomorphology		Glacial Geology			
	Remote Sensing		Remote Sensing			
	<b>Total EUs 2B:</b>		<b>Total EUs 2B:</b>		<b>Total EUs 2B:</b>	

\*NOTE: Courses for sections 1A and 1B must be from 1st year or higher university level courses acceptable for credit towards a degree in science, applied science or engineering. Introductory geoscience is not included in the EU count as it is anticipated that this course would have been required for admission to year 2 core geoscience courses. For sections 2A, 2B or 2C the courses must be 2nd year or higher. Also see notes on Page 1.

2C EUs are located on pages 3 through 5.

**Summary:**

- 1A Compulsory Foundation Science** \_\_\_\_\_ EUs of 3 EUs
- 1B Additional Foundation Science** \_\_\_\_\_ EUs of 6 EUs
- 2A Compulsory Foundation Geoscience** \_\_\_\_\_ EUs of 4 EUs
- 2B Additional Foundation Geoscience** \_\_\_\_\_ EUs of 5 EUs
- 2C Other Geoscience/Science** \_\_\_\_\_ EUs of 9 EUs

Recommended Requirements	Geology	Course #	Environmental Geoscience	Course #	Geophysics	Course #	
<p><b>2C Other Geoscience</b></p> <p>(Minimum Total 9 EUs)(9 EUs must be from the EUs list or must be at a second year level or higher acceptable for science credit toward a degree in science, applied science or engineering and <b>relevant to geoscience</b> as acceptable to the Registration Committee) (Extra courses not used in 2A and 2B can be used in 2C. Advanced courses in these topics can also be used. No one single EU course can be used to cover more than one requirement.)</p> <p>The three broad streams of specialization in geoscience (geology, environmental geoscience and geophysics) embrace distinct knowledge sets that are important to geoscientists in each stream, and collectively comprise the particular knowledge base necessary for proper and appropriate practice.</p>	<p>Within each subject area are listed possible courses that could be used to satisfy the geoscience knowledge requirements.</p> <p><b>Communication</b></p> <p>Thesis</p> <p>Technical Writing</p> <p><b>Earth Systems</b></p> <p>Climatology</p> <p>Meteorology</p> <p>Oceanography</p> <p>Earth Systems</p> <p><b>Environmental</b></p> <p>Hydrogeology</p> <p>Hydrology</p> <p>Environmental Geology</p> <p>Limnogeology</p> <p>Biogeochemistry</p> <p><b>Field Techniques</b></p> <p><b>Geochemistry</b></p> <p>Exploration Geochemistry</p> <p>Environmental Geochemistry</p> <p>Isotope Geochemistry</p> <p>Aqueous Geochemistry</p> <p><b>Geomorphology</b></p> <p>Quaternary Geology</p> <p>Pedology</p> <p>Geomorphology</p> <p><b>Geophysics</b></p> <p>Physics of the Earth</p> <p>Exploration Geophysics</p> <p>Applied Geophysics</p> <p>Environmental Geophysics</p> <p><b>Geotechnical</b></p> <p>Natural Hazards</p> <p>Engineering Geology</p> <p>Soil Mechanics</p> <p>Rock Mechanics</p> <p><b>Mineralogy</b></p> <p>Crystallography</p> <p>X-ray Crystallography</p> <p>Optical Mineralogy</p> <p>Analytical Methods</p>			<p>Within each subject area are listed possible courses that could be used to satisfy the geoscience knowledge requirements.</p> <p><b>Communication</b></p> <p>Thesis</p> <p>Technical Writing</p> <p><b>Earth Systems</b></p> <p>Climatology</p> <p>Meteorology</p> <p>Oceanography</p> <p>Paleoenvironmental Studies</p> <p>Paleoclimatology</p> <p>Paleoecology</p> <p>Paleobiology</p> <p><b>Environmental Assessment</b></p> <p><b>Field Techniques</b></p> <p><b>Geochemistry</b></p> <p>Environmental Geochemistry</p> <p>Isotope Geochemistry</p> <p>Aqueous Geochemistry</p> <p>Biogeochemistry</p> <p>Atmospheric Geochemistry</p> <p>Low temperature Geochemistry</p> <p><b>Geomorphology/Surficial</b></p> <p>Geomorphology</p> <p>Natural Hazards</p> <p>Quaternary Geology</p> <p>Pedology</p> <p>Glaciology</p> <p><b>Geophysics</b></p> <p>Environmental Geophysics</p> <p>Exploration Geophysics</p> <p>Applied Geophysics</p> <p><b>Geotechnical</b></p> <p>Engineering Geology</p> <p>Soil Mechanics</p> <p>Rock Mechanics</p> <p>Resource Geotechnics</p>		<p>Within each subject area are listed possible courses that could be used to satisfy the geoscience knowledge requirements. <b>Note:</b> EUs must be chosen from at least 4 of the boldfaced subject areas below.</p> <p><b>Applied Math/Physics</b></p> <p>Calculus</p> <p>Computer - Controlled Instrumentation</p> <p>Condensed Matter Physics</p> <p>Continuum Mechanics</p> <p>Digital Signal Processing</p> <p>Electromagnetic Theory</p> <p>Electronics for Scientists</p> <p>Fluid Dynamics</p> <p>Fluid Flow</p> <p>Porous Media</p> <p>Geostatistics</p> <p>Integral Transforms</p> <p>Linear Algebra</p> <p>Mathematical Physics</p> <p>Numerical Methods/ Computing</p> <p>Optics</p> <p>Partial Differential Equations</p> <p>Signal Analysis</p> <p>Vector and Tensor Analysis</p> <p><b>Communication</b></p> <p>Thesis</p> <p>Technical Writing</p> <p><b>Earth &amp; Planetary Geoscience</b></p> <p>Geomagnetism/ Paleomagnetism</p> <p>Global Tectonics</p> <p>Global Geophysics</p> <p><b>Field Techniques</b></p> <p><b>Fundamental Math/Physics</b></p> <p>Complex Analysis</p> <p>Differential Equations</p> <p>Electricity &amp; Magnetism</p>	
	<b>Page Total EUs 2C:</b>		<b>Page Total EUs 2C:</b>		<b>Page Total EUs 2C:</b>		



