

UNIVERSITY OF CALGARY | FACULTY OF SCIENCE

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# CURRICULUM REVIEW REPORT

DEPARTMENT OF GEOSCIENCE

December 22, 2016







# Executive Summary

## Overview and Context of the Program

Formed in 1963, the Department of Geoscience is a vibrant cornerstone of the University of Calgary. Originally the Department of Geology, the growth of additional disciplines such as geophysics, hydrogeology and environmental geology brought about the name change to Department of Geoscience. The Department is internationally and nationally recognized for its strengths in seismology, petroleum geology, hydrogeology, petrology and regional tectonics, among others. Currently the Department offers Bachelor of Science degrees in both Geology and Geophysics, as well as a BSc/Geology with a concentration in Petroleum Geology. Although not the object of this review, the Department also offers thesis- and course-based MSc degrees, an interdisciplinary MSc in Reservoir Characterization, and PhD programs of graduate study.

The Department is ideally located in at least two ways. It is situated in 'Canada's Energy Capital' that provides a fertile ground for Petroleum related research and educational programs and it is located next to world-class geological laboratories exemplified by the Canadian Cordillera (or Rocky Mountains) and the Western Canada Sedimentary Basin. The Department continues to be the Geoscience Department with the highest number of undergraduate students in North America despite the recent downturn in the economic outlook for the energy sector. The department plays a major role in advancing research

### **Geophysics Program Learning Outcomes:**

Graduates from the geophysics degree program should be able to

1. Explain the physical and mathematical principles underlying geophysical systems (including governing equations, kinematics, boundary conditions).
2. Explain and illustrate fundamental geophysical theories (acoustic/elastic waves, potential fields, fluid dynamics, electromagnetics).
- 3.





# Action Plan

**Action Plan:**

This section is a concise Summary Table of how to address changes emerging from the curriculum review process.

Recommendation	Action Item	Timeline
<p><b>S1/GLGY</b> – Evaluate the need to require additional, upper-level Field Schools in the Geology curriculum, and the feasibility to offer them.</p>	<p>Monitor enrollments. Investigate funding models. Modernize delivery of field schools.</p>	<p>Ongoing and short-term (1 year)</p>
<p><b>S2/GLGY</b> – Review and modify original design of ‘new’ GLGY curriculum core courses.  <i>[in conjunction with S1/G&amp;G Action Item].</i></p>	<p>Task course- and stream-based sub-committees with re-evaluation of core courses.  <i>[starting with 1<sup>st</sup> and 2<sup>nd</sup> year courses, then 3<sup>d</sup> year]</i></p>	<p>Short term (1-2 yrs)</p>
<p><b>M1/GLGY</b> – Evaluate extent of quantitative/numerical skills of geology students and knowledge base of fundamental science concepts (Chem, Bio, Phys) as applied in geoscience.</p>	<p>Conduct inventory of problems used in teaching of all GLGY courses, which include:  Quantitative/numerical reasoning and skills. Application of fundamental science concepts (Chem, Phys, Bio).</p>	<p>Medium term (3-4 yrs)</p>
<p><b>L1/GLGY</b> – Improve quantitative/numerical skills and knowledge of fundamental science concepts based on results of M1/GLGY Action Item.</p>	<p>Task course- and stream-based sub-committees</p>	

Recommendation	Action Item	Timeline
<p><b>S1/GOPH</b> – Compile all Course Learning Objectives currently assigned to courses, and examine them in isolation from their courses, identifying connections with Program Learning Objectives.</p>	<p>Compile comprehensive list of GOPH CLOs</p> <p>Map low level CLOs to PLOs</p>	<p>Short term (1-2 yrs)</p>
<p><b>S2/GOPH</b> – Discuss any significant gaps in the GOPH curriculum identified in S1/GOPH Action Item.</p>	<p>Present results of mapping from S2/GOPH Action Item to GOPH faculty, students and other stakeholders</p> <p>Gather feedback on any gaps observed by stakeholders</p> <p>Special attention to integration of fundamental mechanics and mathematics</p>	<p>Also for PLOs</p>