



Earth and Space Science Engineering

Cyclical Program Review

Executive Summary

OFFICE OF THE
VICE PROVOST
ACADEMIC

4700 Keele St.
Toronto Ontario
Canada M3J 1P3
Tel 416 736 5498
Fax 416 736 5876

Program description

The Department offers a three-year Bachelor degree in Earth and Atmospheric Science and four- year Honours Bachelor degrees in the following areas: Earth Science (geomatics), Atmospheric Science, Space Science, Geomatics Engineering (not under this review), and Space Engineering (not under this review). Honours degree candidates in Earth Science must complete the Earth Science Core and Honours degree candidates in Atmospheric Science must complete the Atmospheric Science Core. In addition, a variety of Honours Double Major Programs with other departments are offered. Honours Major/Minor programs also exist involving ESSE majors or minors with minors or majors in other Science disciplines and in other Faculties.

The Department provides instruction in the fundamental sciences of the Earth and its atmosphere including structure and dynamics of the deep interior, motions in the fluid outer core and the origin and maintenance of the main magnetic field, convective motions in the solid mantle and surface plate tectonics, rotational dynamics of the Earth and space geodynamics, exploration geophysics, geographical information systems (GIS), atmospheric motions and composition, numerical modelling of atmospheric dynamics and convection, radar sounding of the atmosphere, and remote sensing of the Earth from satellites.

The Graduate Program in Earth and Space Science (ESS) is a multidisciplinary research program associated with the Department of Earth and Space Science & Engineering (ESSE) and the Centre for Research in Earth and Space Science (CRESS). The graduate program provides postgraduate instruction and research experience for graduate students working towards either MSc or PhD degrees. Research is carried out under the supervision of ESS faculty members, who are drawn from a number of science departments within York University or Adjunct Faculty Members appointed to the Graduate Program.

Program	Accepts 2013	Enrolment FETES 2013	Degrees Awarded 2013
BSc	26	86	12
MSc	16	27	6
PhD	8	39	6

Reviewers:

Dr. John R. Gyakum, McGill University (External)
Dr. Jeffrey M. Forbes, University of Colorado (External)
Dr. Richard Bello, York University (Internal)

Site Visit: October 1-3, 2013

Reported to Joint-Committee: May 2014

Outcome: The Joint-Committee on Quality Assurance concluded that the Decanal response adequately addressed the review recommendations. Follow-up report due **November 2015**.

Program Strengths

- Clear vision of an Engineering program with a strong Science component evident in graduate and undergraduate curriculum
- Clear commitment to innovative education with articulated directions for improvements in pedagogy, experiential learning, and social learning and plans to increase internship opportunities
- Clearly articulated program learning outcomes that align with degree level expectations
- Strong research programs on the part of faculty members with international reputation in earth, atmospheric, space and planetary sciences

Opportunities for Program improvement

The reviewers made several recommendations for improvement that include the following:

- Align admissions requirements for Science students with those of Engineering students
- Enhance course requirements for the Master's and PhD programs and consolidate the undergraduate Science streams to improve rigour
- Provide hands-on experience in weather prediction and introduce current topics throughout
- Create a single Science degree with two streams: existing certificate in meteorology and a stream to prepare students for graduate level education with option to complete joint BS/MS degree
- Create minor options for students in other Lassonde School of Engineering Departments
- Expedite processing of graduate school applications
- Improve communication skills of instructors and teaching assistants

Decanal Implementation Plan

The Department of Earth and Space Science and Engineering is now housed within the recently founded Lassonde School of Engineering and the Decanal Implementation Plan has been issued by the Associate Dean Academic of the School. The plan points out that a period of transition is necessary while the new School develops its financial plan and strategy for enrolment growth.

The plan supports many of the recommendations but points out that curriculum renewal must balance competing priorities. The Department is urged to consider consolidation of the science degrees, to explore the possibility of a joint BS/MS degree, to enhance laboratory experience, and to create a comprehensive complement plan.

The plan identifies the expansion of Engineering as having the potential to provide new opportunities for increasing enrolments in the Department's graduate programs and for resource sharing. As well, the School's plans to restructure graduate education will support the Department's efforts in this area. The plan is supportive of initiatives to improve communications skills of instructors and teaching assistants.

The plan notes that the Department has already produced an interim implementation plan that addresses enrolment growth, faculty hiring requirements, and the need for fiscal restraint.

Executive Summary

As one of two founding departments in the Lassonde School of Engineering, Earth and Space Science Engineering will benefit from the energy and creativity that brings about the new. The Decanal Implementation Plan sees alignment of vision among the School, the issues and strategies identified by the unit, and the reviewers' recommendations and supports the Department's plans to strengthen and consolidate its offerings and identity. The Department will benefit from resource sharing and participation in graduate education restructuring as Lassonde develops. The Decanal Plan stresses the importance of strategic decision-making to maximize resources and to increase student enrollment and experience.

Alice J Pitt, Vice-Provost Academic
May, 2014

