



# **Curriculum Review – PUBLIC Report**

## **Department of Geomatics Engineering**

### **Schulich School of Engineering**

**<http://schulich.ucalgary.ca/>**

**May, 2017**

#### **1. Context**

Created in 1979, the Department of Geomatics Engineering in the Schulich School of Engineering at the University of Calgary is the only Geomatics engineering department in Western Canada

and is internationally recognized as a leader in undergraduate and graduate education as well as research. With 19 faculty members and more than 300 undergraduate and graduate students, it is the largest department of its kind in Canada. Our undergraduate degree program is accredited by two national bodies: the Canadian Engineering Accreditation Board (CEAB); and the Canadian Board of Examiners for Professional Surveyors (CBEPS).

The department has strong ties to both the engineering and land surveying professions that is formalized by the Geomatics Engineering Advisory Committee (GEAC), which meets twice per year to provide advice about the Department's teaching and research programs, and the Geomatics Engineering Liaison Committee (GELC), which meets once per year to discuss matters of common interest to the department and to the professional land surveyors associations.

The department's undergraduate program was originally modelled after similar leading programs worldwide has been developed through a continual process of review and improvement that has always included consultation with our students, faculty, alumni, the two accreditation agencies, and our two industry advisory committees.

### 3. Guiding Questions

The curriculum review team met with students and faculty members and drew upon the past experiences of these groups to identify several areas for possible improvement within the curriculum. Many of these were deemed to be covered by the following questions, which were used to focus the curriculum review process:

1. Are students getting opportunities to acquire fundamental knowledge in the field?
2. How are the content and theories in the core courses built upon in subsequent courses?  
How are we scaffolding student learning throughout the program?
3. Where are the bottlenecks in the program and how do we resolve them?
4. Do we have the right prerequisite courses for courses in our program?
5. How do we attract and retain students in our program?

The last question above is not related to curriculum *per se*, but is critical to the success of our curriculum because having students that are engaged and interested in the program/material makes for a richer learning environment that benefits everyone.

## 8. Action Plan

In light of the findings and recommendations in the previous section, the table on the following pages presents the action plan that spans the next five years. Note that our department's priority for the next six months is successful completion of two professional accreditation processes. Accordingly, most of the items in the action plan labelled "1 year" will begin in November/December 2017

Recommendation		Action Item	Timeline for Implementation	Lead Responsibility
Rec-A	Identify the key topics graduates of the program are expected to master	Draft initial list of key topics	1 year	Department Undergraduate Committee
		Seek input from industry liaison committees and alumni, and update list accordingly	1 year	Head and Associate Head Undergraduate
Rec-B	Determine what students perceive as the major challenges to understanding key topics in the program	Meet with a selection of undergraduate students to get their feedback on major challenges	1 month	Department Undergraduate Committee
		Develop questionnaires to allow for ongoing data collection; this could be done per year or per course, as appropriate	1 year	Support from admin staff
Rec-C	Perform a "critical path" analysis to determine where the key topics are currently introduced, developed and used	Identify where key topics are introduced, developed and used throughout the program	2 years	Department Undergraduate Committee
		Identify deficiencies in progression of material along the critical path and implement curriculum changes as appropriate	3 years	Department Undergraduate Committee

		Review feedback from student (see Rec-B) and refine critical paths as appropriate	3 years	Department Undergraduate Committee
Recommendation		Action Item	Timeline for Implementation	Lead Responsibility
Rec-D	Identify what students perceive as the main stumbling blocks in the bottleneck courses, especially ENGO 333, 343, 361 and 431. (concurrent with Recommendation B)	Meet with a selection of undergraduate students to get their feedback on major challenges  If possible, also determine why these are problematic, which may include specific topics from prerequisite courses, being too far removed from prerequisite courses, or the manner in which new material is introduced.	1 year	Department Undergraduate Committee
		As appropriate, modify bottleneck courses to improve student success, for example, by reinforcing key prerequisite material or changing lab assignments.	3 years	Department Undergraduate Committee
		Review critical path analysis (see Rec-C) and consider whether a new ENGO course could be used to replace a common core course in order to better prepare students for the program	1 years	Department Undergraduate Committee

Recommendation		Action Item	Timeline for Implementation	Lead Responsibility
Rec-E	Assess student performance on different aspects of bottleneck course (e.g., labs vs. exams) to determine if the evaluation methods may be impacting DFW rates	Compile statistics on how students perform on different aspects of bottleneck courses	2 years	Admin support
		Analyze statistics to determine if there are problem areas; seek feedback from undergraduate students if appropriate	3 years	Department Undergraduate Committee
Rec-F	Identify options for facilitating student success, especially in bottleneck courses but also within the program as a whole	Implement methods to improve student success over the period of 1–2 years	2 years	Department Undergraduate Committee in conjunction with Elena Rangelova, Quazi Hassan and Kyle O’Keefe as part of a Taylor Institute sponsored project.
		Develop a mechanism for tracking the impact of each methods within a given course and in follow-on courses	3 years	Admin help
		Analyze data to determine which methods are most beneficial and adjust accordingly	4-5 years	Associate Head - Undergraduate

Recommendation		Action Item	Timeline for Implementation	Lead Responsibility
Rec-G	Better support and/or facilitate students who do not “clear” a bottleneck course (i.e., who receive a grade of D+ or lower)	Identify short-term methods of allowing student to continue progressing within their program, for example, by allowing them to take a supplemental exam or removing some prerequisite courses	1 year	Associate Head - Undergraduate
		Consider longer-term solutions that may require changing/moving course content to remove some prerequisite requirements	3 years	Department Undergraduate Committee
Rec-H	Re-evaluate prerequisite course requirements	Reassess whether listed prerequisites are truly necessary and not “nice to have”.	2 years	Department Undergraduate Committee
		Consider whether a grade of C- or better is required for prerequisite courses and, if necessary, update PeopleSoft to allow for lower grades	3 years	Department Undergraduate Committee and SSE Undergraduate Studies Committee through calendar revision process
		Repeat the above reassessment following completion of the critical path analysis (see Rec-C)	4–5 years	Department Undergraduate Committee

Recommendation		Action Item	Timeline for Implementation	Lead Responsibility
Rec-1	Work to attract more 1 <sup>st</sup> -year students to our program and reduce 2 <sup>nd</sup> -year attrition	Provide information sessions to better inform 1 <sup>st</sup> -year students about our program and to dispel any negative perceptions	Ongoing	Department Undergraduate Committee with buy-in from all Faculty members
		Work with industry to promote the application of Geomatics Engineering to a wide range of industries	Ongoing	Head with GEAC and GELC Industry committee members
		Work with SSE Communications to create and maintain an up-to-date website as well as brochures that can be used to advertise the department	1 year	Head and Associate Head - Undergraduate
		Work with Dean's office and the SEE undergraduate studies committee to provide 1 <sup>st</sup> -year students with a more comprehensive, self-driven understanding of each department	3 years	Head and Associate Head – Undergraduate

		<p>Work with EUSC to develop a proposal for a web-based tool to link students' strengths and interests to the different departments within the School. Deploy/use the tool as part of the SSE admissions process, within the 1<sup>st</sup>-year curriculum and/or to high school guidance councilors</p>	4-5 years	Head and Associate Head Undergraduate
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