

EXECUTIVE SUMMARY FOR PROGRAM REVIEW

*The Executive Summary will be presented to Fleming College’s Academic Council and Executive Leadership Team for information and feedback. The Executive Summary will also be provided to Fleming College’s Board of Governors.*

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| Subject: | School of Environmental & Natural Resource Sciences Program Review Report  |
| Program Name: | Earth Resources Technician (ERT) |
| Presented By: | Linda Skilton |
| Action: | For Discussion / Information  |

SOURCE

* Fleming College’s Curriculum Renewal and Program Review (College Policy 2-207)
* Fleming College’s Quality Assurance Policy (College Policy 2-213)
* Board of Governors By-law (1-102 - reference section 39.6)
* Academic Council Terms of Reference (https://department.flemingcollege.ca/vpa/academic-council/terms-of-reference/)

Reference Documents

* Ministry of Training Colleges and Universities: Minister’s Binding Policy Directive, Framework for

Programs of Instruction http://www.accc.ca/ftp/es-ce/MTCUCollegeFramework.pdf

* Guidelines for the Program Review and Curriculum Renewal process and templates are located on the Centre for Learning and Teaching Website. http://flemingclt.ca
* Ontario College Quality Assurance Service - http://www.ocqas.org

BACKGROUND

Fleming’s quality assurance process includes a two-staged process that includes: Curriculum Renewal (conducted annually) and Program Review (conducted every five years). These two internal processes are integrated so there is an *ongoing* focus on curriculum quality.

The Program Review process is characterized by both depth and breadth of analysis. Program data is collated, reviewed and assessed against given criteria, providing a measure of both the vitality and viability of each program. Based on this analysis, long-term plans are then created to guide continuous curriculum improvement and build on the cumulative outcomes of annual curriculum renewal. At the end of this process, a Program Review Panel (convened by the Dean) is charged with the responsibility of making recommendations concerning program viability as well as suggesting program/curriculum revisions.

In adhering to the mandate of the Academic Council to receive reviews of existing programs of instruction, the Executive Summary for the School of Environmental & Natural Resource Sciences is hereby provided, for the Council’s information.

PROGRAM STRENGTHS

The Earth Resources Technician program allows graduates to pursue diverse career opportunities ranging from the analysis of soil and rock, to groundwater assessment, from mineral exploration, to civil engineering and environmental consulting. The key strength of the program is the applied, hands-on learning and co-op experience. The mandatory, 6 month paid co-op work term enhances program delivery and results in highly prepared and skilled graduates. These graduates are highly successful in attaining employment.

Another strength of the program is the unique mix of integrated courses in minerals, geophysics, geotechnical and environmental assessment that gives graduates a well-rounded and comprehensive skill set to prepare for a career in most workplaces of the applied geology field. It is also important to note that Fleming College is the only college that offers such depth and breadth in geotechnical studies.

Lastly, the program has developed many pathways for program graduates. In particular, the successful 2+2 articulation agreement with Acadia University allows students to obtain both a degree and diploma in four years. Presently, meetings are underway with Trent University to create a unique 2+2 articulation agreement for the ERT students. The hope in the design of this partnership is to place the graduates in a position to register as a Professional Geologist under statute in Canada upon graduation from Trent.

PROGRAM CHALLENGES

There are two main challenges to the ERT program: lack of expertise in geophysics resulting in curriculum delivery challenges; and lack of physical resources and up-to-date equipment. First of all, the recent retirement of a full-time faculty member has resulted in a loss of specific expertise in geophysics. The recent new full-time hire has not replaced this area of expertise but rather has brought strength in mineral exploration. The breadth of the program requires experts in several fields of applied geology. In addition, recent mapping of the curriculum suggests there may be other gaps in the curriculum that will need to be addressed. Aligning and renewing the curriculum will be difficult without the needed expertise in the main areas of applied geology delivered in the program curriculum.

Secondly, the geology teaching laboratories are dated, worn and poorly configured given the current class size. The program compensates by relying on the support and collaborating with the Heavy Equipment and Resources Drilling and Blasting programs. Other shortfalls are the lack of up-to-date or sufficient quantities of equipment, software and audio visual equipment. Industry quality lab facilities are required in order to deliver and expand the program. To compound this issue, since the introduction of the co-op component in the program, it has become increasingly difficult to manage the expectations of students returning from their work term experiences. These students return to college after being exposed to up-to-date equipment, software and lab facilities available to them during their work term. Students become more critical in their analysis of the program and college facilities and this, in part, may explain recent KPI results below. Although this is challenging, students do mature faster and become better advocates for themselves and for their program.

KPI RESULTS

Graduates of the ERT program are very successful securing employment. The program success rate of 87% in employment rate in all careers is higher than the College average of 83%. Further it is noteworthy that approximately 10% of each graduating class is certain to stream directly to university into a science or engineering degree program. In addition, the program percentage of graduates securing employment in applied geology is 78% in contrast to the College average of 53% for all other program graduates securing employment in their field of study. The ERT students are self-motivated to be in the earth sciences field, and are acquiring skills, knowledge and support to pursue employment in their field. Employers are clearly recognizing this and hiring our graduates.

The average program KPI result for Graduate Satisfaction with Generic Learning outcomes was 83% in comparison with the College average of 87%. Satisfaction with the overall learning experience was 80% for the program and 82% for the College. Satisfaction with the teachers was 71% for the program and 75% for the College. Lastly, Graduate Satisfaction with the Program was 82% for the program and similarly 83% for the College. It is highly likely that the students responded to the first three satisfaction questions based upon academic delivery issues at the College as explained previously. Students returning from co-op work experiences have very high expectations and develop advocacy skills.

It is also important to note that the program delivery has changed significantly over the past five years with the addition of the mandatory co-op experience. The program struggled to adapt to the radical change a decade ago when the third year of the program was terminated. Then, in 2010, the faculty took on the challenge again of compressing curriculum content with the introduction of a mandatory co-op learning experience. Further, on the basis of industry requests, courses are being re-sequenced to increase core content knowledge in students prior to starting their co-op work terms and new content is being developed to keep up with trends in the industry. This state of constant change in curriculum delivery has likely impacted KPI results but should improve as the program adapts to changes required by the mandatory co-op component.

Lastly, the five year average graduation rate of the ERT program is 71% which is higher than the College average of 66%.

SUMMARY OF RECOMMENDATIONS

Recommendations Building on Program Strengths:

1. Moderately increase applied learning by streamlining field time in academic courses to further build on the applied, hands-on learning of the program.
2. Place the Co-op Preparation (APST 89) course in the first seven weeks of Semester 2 in order to increase a student’s ability to secure co-op employment. In order to achieve this, the Introduction to Sampling Protocols (GEOL 64) would need to be placed in the back seven weeks.
3. Explore timing of the co-op component and the costs to students of housing given the extended period of the co-op work term to determine if co-op completion can be improved.
4. Provide students with further detailed expectations regarding co-op course sequencing and provide alternate times to complete this component to increase student success in the co-op component.
5. Create a plan for encouraging more direct involvement of industry and alumni in program delivery (e.g. guest speakers, materials and/or equipment donations, Fleming hosted forum/panel) to further strengthen the program’s relationship with industry.
6. Continue to foster the steady increase in prospective students that enter the program each fall (about a 40% increase in the last 4 years).

Recommendations Developed to Address Gaps Identified:

1. Advocate for the replacement of expertise loss in geophysics in order to improve student satisfaction and curriculum quality.
2. An in-depth analysis will be undertaken by the ERT program team to confirm and address possible gaps and redundancies discovered in program curriculum mapping.
3. Review assessment plans for all courses (core and non-core) in order to realign student workload.
4. Significantly increase content and rigor in Semester 1 preparation courses (CFS redesign – changes to ECOS 13) which is now in progress.
5. Increase soils and aggregate training of semester two students and introduce pavement design in the Soil Mechanics (NATR 91) as suggested by industry.
6. Investigate the replacement of the Digital Imaging Processing for Natural Resources (NATR 7) course with a dedicated ERT course in Remote Sensing of abiotic natural resources to increase student satisfaction and curriculum quality.
7. Continue to convert paper and analytical teaching materials into AODA conversion ready digital formats. Research possible software donation from industry to accomplish this task in part.
8. Increase rock and mineral sample collections, as well as rock, mineral and exploration teaching materials in order to support an increase in rock and mineral curriculum content.
9. Advocate for improved laboratory facilities and maintenance of existing facilities.
10. Investigate the requirement of laptop or tablet for use in the lab.
11. Investigate incorporating the use of smart phones as data collection devices in core courses.
12. Determine acceptable equivalent core and non-core courses available to students at Fleming and other institutions that will satisfy the ERT diploma requirements. This list of acceptable courses could then be used to help students determine a pathway to completing missing academic course credits in order to graduate with their ERT diploma.

Program Review Panel Meeting Date: April 9th, 2015 by teleconference

Program Review Panel Participants:

 Chair: Mary Ann Fader

 Program Co-ordinator: Brian Gerry

 Curriculum Consultant: Kris McBride

 Program Faculty/Support (maximum 4): Joanna Hodge

 External Members (minimum 3): Brian Schuyler, Cornel van Zyl, Robert Valliant