

REPORT OF THE ACADEMIC PLANNING COMMITTEE TO THE REGULAR November 2012 SENATE

FOR INFORMATION

Eighteen-month follow-up from ACAPLAN's recommendations from the Undergraduate Program Review for the following program: Chemical Engineering

Below is an excerpt from the Institutional Quality Assessment Process at Laurentian University approved at the Quality Council in June 2011.

PROCESS FOR FOLLOW-UP

No later than 18 months after Senate submission, those responsible for implementing the changes writes a report to the Dean and to ACAPLAN, on the actions it has taken in response to the review. If ACAPLAN does not find the response satisfactory, it may ask the program for further actions.

Response to the recommendations and commendations of ACAPLAN Following the Undergraduate Program Reviews: Chemical Engineering

The School of Engineering completed the Self Study Report for the program in Chemical Engineering in September 2008. The External review, headed by Dr. Leonardo Simon (University of Waterloo) was conducted in April 2009, with the final report submitted April 2010. In October 2010, the School of Engineering responded to the External Reviewer's Report.

The review committee was chaired by Dr. Simon, and included Dr. Kalpdrum Passi (Mathematics and Computer Science), Ashley Thomson (Library) and Lisa Renaud and Alana Jones (student representatives). The committee met with a number of people including the administration, faculty, stakeholders (Vale), and undergraduate students. The review stated that the "program is consistent with meeting its core objective – serving the local economical and societal needs...". While several recommendations were made, there are several outstanding issues addressed by the report, including the inherent instability of developing a new engineering program with the required accreditation, heterogeneity in the quality of teaching (as identified by the students), and the addition of necessary courses.

Student Issues

1. Commendations

- a. Small class sizes contribute to an enhanced experience with faculty instructors.
- b. The growth of the program in undergraduate enrollment (almost 300% growth in the past three years) as a result of faculty visits to area high schools.
- c. Students appear to be highly motivated and successful (recent awards in Design competition).

2. Recommendations

- a. Timetabling of courses should be more consistent from year to year, and changes in course curriculum should be minimized in order to facilitate student graduation.

We have addressed the issue of timetabling of courses to a large extent starting September 2009. However, there is only so much we can do since we do not have dedicated classrooms for the School of Engineering except perhaps F-228. The final timetable is set by the Registrar's office based on enrolment numbers and availability of classrooms.

As far as changes in course curriculum, these are done in response to issues and recommendations in the Canadian Engineering Accreditation Board (CEAB) Visiting Team's report. We have had two such visits in a short period of time (January 2006 and November 2007) since the program started (September 2004) and the UPRAC review (April 2009). While we have tried to minimize the changes in curriculum in order to facilitate student graduation, we cannot ignore the issues raised by the professional external accreditation body. Students (and for that matter, faculty) may not like curriculum changes but they are aware of the risk of losing accreditation if the issues are ignored. Our common goal (students and faculty) is to achieve an accreditation of six years which is the maximum given by CEAB to an engineering program.

- b. The School should consider increasing the time available for the laboratory section of ENGR 3267 (Process Control), giving the students more time to run the experiment(s).

We have addressed this issue by increasing the time (and sections) allocated for most upper year Chemical Engineering courses that require laboratory.

- c. Given the large number of sessionals, the quality of instruction appears to be heterogeneous. The School should attempt to improve instruction where appropriate.

This is not in the hands of the School. If the university administration is willing to give the School additional resources and faculty complement, this will (or should) not be an issue. Until it happens, we will have to live with sessionals to deliver some of our courses.

- d. Increasing the number of external speakers to the department would enhance the learning experience for students.

We are cognizant of the effect of external speakers on enhancement of learning experience for undergraduate students. We have always encouraged upper year undergraduate students to attend the weekly graduate seminar course (ENGR 5116/6116) where we have presentations from industry and other universities. The operating budget of the School is quite disproportionate to undergraduate enrolment, and currently we do not have the financial resources to invite additional external speakers. Once the \$10 million donation from Bharti Family starts flowing, we will certainly be able to increase the number of external speakers to the School.

e. Many students have summer jobs with a research component, and the School should consider providing credit for these positions.

Most students who have summer jobs in the School/University with a research component are in the co-op program. In fact, they are registered in ENGR 000X course during each work term, and this is shown on their academic transcript. Please keep in mind these are non-credit courses. If these become credit courses, are students willing to pay extra tuition fee in addition to the co-op fees? We can certainly create an additional non-credit research course for those undergraduate students who are not in the co-op program, and it can be reflected on their transcript.

f. There are serious issues with scheduling conflicts in the programming. The School should work with the registrar to resolve this.

Our enrolment numbers have exploded since we started the Mechanical Engineering program in September 2009, and we have been working with the Registrar's office to minimize scheduling conflict. As mentioned earlier, this would not be a serious issue if we had classrooms dedicated for the School of Engineering.

g. The library does not (and should) carry copies of the course text books. Faculty Members should provide a copy of their textbooks to the library.

The library budget for the School (and probably for other academic units) has been slashed drastically in the last few years. While it is easier for students to have access to (or obtain) e-copies of textbooks these days, we have encouraged faculty members to provide at least one hard copy of their textbook in the library.

Program Issues

1. Commendations

- a. The Co-op program appears to be functioning very well, and the students are satisfied with the quality of jobs.
- b. The Technical Elective in Polymers is well received.
- c. Laboratories and equipment are state-of-the-art
- d. The School has developed a course in Product Development.

2. Recommendations

- a. The Chemical Engineering program should include ENG 2076 (Strength of Materials) as a mandatory course.

We have been struggling with the inclusion of ENGR 2076 (Mechanics & Strength of Materials I) in the Chemical Engineering curriculum considering the fact that it is a mandatory core course at the second year level in our Mechanical and Mining Engineering programs. However, we do not have space in the second year of our Chemical Engineering program. Surprisingly, this has never been raised as an issue by the Canadian Engineering

Accreditation Board (CEAB) visiting teams in January 2006, November 2007, and January 2011. Please note that it has taken us three external accreditation visits starting January 2006 to get to where we are with the curriculum, and trying to free up space to include ENGR 2076 as a mandatory course would involve a substantial change in the curriculum. Our next CEAB visit is in November 2013, and it is important we do not attempt to make a substantial change in the curriculum at this stage. At this stage the only way to include ENGR 2076 as a mandatory course in the Chemical Engineering curriculum is to add it as a seventh course in the first term of second year, thereby increasing total credits for the program from 144 to 147. This would involve additional burden (course load and financial) on the students. This is certainly not desirable.

If we are able to get a six-year accreditation for Chemical Engineering in July 2014, we will certainly do our best to include ENGR 2076 as a mandatory course in the Chemical Engineering curriculum starting as early as September 2014 while maintaining the overall credits for the program at 144.

b. The Engineering Design Project (ENGR 4435) is a demanding course that the School should consider increasing from 6 to 9 credits.

We agree it would be great to make ENGR 4435 a 9-credit capstone design course. However, as with ENGR 2076, trying to free up space to include an additional 3 credits for ENGR 4435 would involve a substantial change in the curriculum. At this stage the only way to have a 9-credit capstone design course is to add 3 credits to the fourth year, thereby increasing total credits for the program from 147 to 150 (if we include ENGR 2076). This would involve additional burden (course load and financial) on the students. Again this is not desirable.

If we are able to get a six-year accreditation for Chemical Engineering in July 2014, we will certainly do our best to make ENGR 4435 a 9-credit course in the Chemical Engineering curriculum starting as early as September 2014 while maintaining the overall credits for the program at 144.

c. If faculty resources permit, more Technical Electives should be planned (eg. – biochemical engineering, product design).

If the university administration is willing to give the School additional resources and faculty complement, we will be more than happy to offer additional technical electives and options within the program. Until it happens, we will have to live with the current offering of technical electives and the two options within the program (Extractive Metallurgy and Mineral Processing, and Environmental Sustainability).

Faculty and Staff Issues

1. Commendations
None identified.

2. Recommendations

None identified.

Research Issues

1. Commendations

None identified.

2. Recommendations

None identified.