

September 22, 2022

Dear Academic Standards Committee:

Herewith is the 1-year report for the Periodic Program Review (PPR) of the **Computer Engineering Program**:

Please see below

- a) 1-year follow up report for the initiatives that were outlined in the Electrical Engineering PPR and as requested by Academic Standards. This is followed by
- b) the UDLEs Learning Outcomes mapping to our program (CEAB) learning outcomes, which were unfortunately omitted purely by oversight in the original PPR document.
- c) A current employer survey has not been done yet and is scheduled to be done in the 2022/23 academic year in collaboration with the new FEAS co-op office

If you require anything further please don't hesitate to contact me.



Dimitri Androustos
Department Chair

Recommendation #1: <i>Introduce Software Engineering option/program</i>
Objective: <i>Develop an option of Software Engineering (which could lead to a separate program)</i>
Actions: <ul style="list-style-type: none"> • <i>Determine what a software engineering option would require in terms of courses</i> • <i>Evaluate other programs and do a comparative analysis</i> • <i>Identify which existing courses would be utilized</i> • <i>Design any new courses</i>
Timeline: 2018/19: <i>Submit for approvals</i> 2019/20 : <i>Start new Software engineering option</i>
Responsibility for leading initiative: <i>Program Director, Computer Stream, Curriculum Committee, Department Chair</i>
Responsibility for approving, providing resources, monitoring: <i>Stream, Curriculum Committee, Departmental Council, Dean, Senate</i>
Status for 1-year Follow-Up Report: The Software Engineering Option has been developed and in place since the 2020 calendar. It has already been well received with a high number of students electing to enrol in the option with currently more students in the software engineering option than the regular computer engineering program. In total there are 420 students enrolled in the option. Our first cohort of 121 students are anticipated to graduate with this option in 2023.

Recommendation #2:

Update and Refresh early core circuit course ELE 202 & ELE 302 laboratory experience. The laboratory experiments have not been changed or updated for a very long time and the lecture content is not in synch with the lab experience.

Objective:

Change lab experiments completely and provide increased and improved training for TAs.

Actions: e.g.

- *Design new experiments;*
- *Test experiments for difficulty and for reasonable time requirements for completion;*
- *Hire a “Lab Lead” to supervise Lab TAs and to provide additional support during lab supervision;*
- *Provide more preparation hours for all TAs to perform all labs before they supervise to ensure they are aware of what the students are required and expected to do;*
- *Have “Lab Lead” train TAs on lab supervision and on the actual lab experiments.*

Timeline:**ELE 302:**

- *Summer 2018: design and test new labs*
- *Fall 2019: introduce new labs into course and sync lecture material*
- *Hire CUPE as Lab Lead*

ELE 202:

- *Winter 2019 Hire CUPE as Lab Lead*
- *Summer 2019: design and test new labs*
- *Winter 2020: introduce new labs into course and sync lecture material*

Responsibility for leading initiative:

Course instructors

Responsibility for approving recommendation, providing any resources made necessary by the recommendation, and overall monitoring of the implementation of the recommendation:

Department Chair

Status for 1-year Follow-Up Report:

- *New laboratory experiments have been created for ELE 202 and ELE 302 as of Fall 2022.*
- *Lab rooms have also been updated to increase the number of workstations so that lab experiments can now be done individually rather than with a partner*
- *Lab Leads have been implemented since 2019*
- *an increased role from our technical staff in the creation and currency of labs equipment and lab assignments*

Recommendation #3:

Create common lab courses, or “lower years engineering design projects”, where semester-long or year-long extended lab projects will support multiple courses.

Objective: (statement that further describes the recommendation)

This recommendation will allow for students to have a better grasp on how the components of various classes fit together in an overall design. For example, a Lab Studio could have as a project a more interesting, involving and practical project that requires knowledge that is taught in the lecture component of numerous courses in the term and/or academic year.

Actions: e.g.

- Identify courses that can be part of the common lab course
 - Remove lab hours from these courses
- Design and test lab projects to be part of the common lab course
- Schedule extended common lab hours for students

Timeline:

- 2019/20 Investigate, analyze and plan
- Departmental approval: by end of September 2020
- Implementation 2021/22

Responsibility for leading initiative:

Department Chair, Program Director

Responsibility for approving recommendation, providing any resources made necessary by the recommendation, and overall monitoring of the implementation of the recommendation:

Department Chair, Program Director, Curriculum Committee, Department Stream Committees

Status for 1-year Follow-Up Report:

This initiative has been discussed at a high level and deemed much too difficult to do at the moment as it would require a major overhaul of all core courses, would require additional resources (i.e., faculty and staff) and would also require buy-in from other departments that provide service courses to the computer engineering program. Discussions at the faculty level during regular meetings and retreats have increasingly made it clear that we may need to progress towards such a model in the coming years, but at a department level we have put this initiative on hold.

Recommendation #4:

Fourth year professional electives need to be evaluated for currency, program need and student interest.

Objective:

COE has a wide range of specialization areas and some of these have changed considerably in the last few years while others have just become extremely significant with an increased industrial, commercial and research interest.

Actions:

- *Analyze enrollment data of all courses over the last 10 years;*
- *Identify courses that are essential;*
- *Identify courses whose content has not changed in the last 5 years and also those that have had very low student demand;*
- *Identify areas/topics that are currently in demand that we do not offer;*
- *Update “stale” courses*
- *Delete courses with historically low interest and/or currently irrelevant topics*
- *Introduce new courses covering topics in emerging and new areas (e.g. AI)*

Timeline:

- *2018/19: analyze enrollment data, identify courses for deletion/refresh, propose new courses*
- *2019/20: roll-out updated professional electives table*

Responsibility for leading initiative:

Department Chair, Program Director, Curriculum Committee, Stream Committees

Responsibility for approving recommendation, providing any resources made necessary by the recommendation, and overall monitoring of the implementation of the recommendation:

Stream, Curriculum Committee, Department Council, Dean

Status for 1-year Follow-Up Report:

- One course has been deleted: ELE 725
- One course has been added: CPS 843
- One course has been updated: ELE 882

Initiative continues to be an ongoing process with further course modifications/offerings/enhancements in the next two years

Recommendation #5:

Improve TA support to undergraduate courses with overall increased stringency on the requirements for selection and also with adequate training and preparation

Objective:

Provide more hours for increased and specialized training for TAs in core courses.

Actions: e.g.

- *identify key courses that have a large number of TAs;*
- *increase preparation/training hours for TAs in those courses;*
- *require TAs to perform and complete all labs that undergraduate students will be doing;*
- *introduce and hire Lab Leads to roam labs and provide extra support and supervision.*

Timeline:

2018/19 academic year

Responsibility for leading initiative: Department Chair

Responsibility for approving recommendation, providing any resources made necessary by the recommendation, and overall monitoring of the implementation of the recommendation: Department Chair

Status for 1-year Follow-Up Report:

- Lab Leads (Head TAs) have been hired for core courses. These Head TAs help to train new TAs on how to supervise labs and help students on essential lab equipment usage and core lab knowledge/skills.
- All TAs, in particular new hires, *must* perform all labs in the course they are assigned to ensure they are familiar with the material
- Additional hours (4 total) have been assigned to TAs that are assigned to courses that they have never TA-ed before so that they can spend more time getting trained on the lab content

<p>Recommendation #6: Integrate opportunities for students to improve and build on soft skills (e.g., leadership, oral presentation, professionalism)</p>
<p>Objective: <i>Introduce more oral presentations in all years, particularly in 2nd and 3rd year, while also providing avenues to cultivate leadership skills.</i></p>
<p>Actions:</p> <ul style="list-style-type: none"> • <i>identify key core courses where students can present orally</i> • <i>provide leadership opportunities to senior graduate students by creating a program that will allow them to mentor students in early years</i> • <i>work with career centre to have them visit classes and hold seminars to relay to students the aspects of professionalism that are essential and to help them cultivate them</i>
<p>Timeline: 2018/19:</p> <ul style="list-style-type: none"> • <i>investigate courses that can easily have oral presentations included in labs and/or group work</i> • <i>invite career centre to plan seminars on professionalism</i> <p>2019/20</p> <ul style="list-style-type: none"> • <i>formally integrate into courses</i>
<p>Responsibility for leading initiative: <i>Department Chair, Program Director</i></p>
<p>Responsibility for approving recommendation, providing any resources made necessary by the recommendation, and overall monitoring of the implementation of the recommendation: <i>Department Chair, Stream</i></p>
<p>Status for 1-year Follow-Up Report:</p> <ul style="list-style-type: none"> - increased the number of oral presentations in 4th year EDP - new 4th year CEN 810 is a large group project that includes interaction with an industry partner where professionalism and oral presentation will be paramount <p>This initiative continues to be discussed and is an ongoing topic, especially in how more courses can integrate these soft skills.</p>

<p>Recommendation #7: <i>Increase the number of co-op internship jobs available to students</i></p>
<p>Objective: <i>Even though our co-op internship is “optional” and students must meet a minimum requirement, there is high demand in the last couple of years. Unfortunately, we have not been proactive to contact new employers for possible internship positions and have relied on our existing employers. With this increased demand we need more potential employers that can provide valid co-op internship jobs.</i></p>
<p>Actions:</p> <ul style="list-style-type: none"> • <i>Identify potential employers in GTA and Southern Ontario</i> • <i>Create 1-page prospectus/flyer that provides quick info on our co-op internship and benefits to the employer</i> • <i>Plan site-visits with potential employers to discuss their participation</i>
<p>Timeline: Fall 2018</p> <ul style="list-style-type: none"> • <i>create prospectus/flyer;</i> • <i>identify possible new employers;</i> • <i>send out email and flyer</i> • <i>follow up and initiate discussion;</i> <p>Winter 2019-</p> <ul style="list-style-type: none"> • <i>continue constant contact with existing employers and continue identifying and inviting new employers.</i>
<p>Responsibility for leading initiative: e.g. Program Chair/Director</p>
<p>Responsibility for approving recommendation, providing any resources made necessary by the recommendation, and overall monitoring of the implementation of the recommendation: <i>Internship Co-ordinator, Program Director, Internship Admin, Department Chair</i></p>
<p>Status for 1-year Follow-Up Report:</p> <ul style="list-style-type: none"> • the FEAS Co-Op office has been created since the PPR was submitted • ~79% of COE students apply and are qualified to take part in co-op • In 2017/18 we had 13 COE students on paid co-op. In 2022/23 we currently have 119. That is a greater than 900% increase. • Nonetheless, this continues to be a priority of the co-op office and the DEPT of ECBE

<p>Recommendation #8: <i>Hire new tenure-track faculty to augment program</i></p>
<p>Rationale: <i>The Computer Engineering program has not been significantly updated since its inception. Hiring some new key faculty members will allow us to refresh the program,</i></p>
<p>Objective: <i>New faculty members that have experience in new current fields of interest and, ideally, with industrial experience, will help to increase the currency and value of the COE program. We will be able to add new courses in new, exciting and relevant areas.</i></p>
<p>Actions:</p> <ul style="list-style-type: none"> • advertise and hire at least 2 new COE assistant-professor tenure track faculty members
<p>Timeline:</p> <p>Fall 2018</p> <ul style="list-style-type: none"> • <i>create posting</i> • <i>advertise</i> <p>Winter 2019</p> <ul style="list-style-type: none"> • <i>interview and hire for July 1, 2019</i>
<p>Responsibility for leading initiative: Department Chair and DHC</p>
<p>Responsibility for approving recommendation, providing any resources made necessary by the recommendation, and overall monitoring of the implementation of the recommendation: <i>Department Chair, DHC, Dean, Provost, VPFA</i></p>
<p>Status for 1-year Follow-Up Report:</p> <p>Three faculty members have been hired to augment the COE program</p>