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To whom it may concern:

Re: 2016 Consultation on Changes to Accreditation Criteria
c/o Engineers Canada

Colleagues:

Re: 2016 Consultation Regarding Changes to Accreditation Criteria

This submission is in response to Kim Allen's May 21 invitation¹ for comments relating to the current proposal for changes to Accreditation Criteria.

SUMMARY OF CURRENT PROPOSAL

First, I summarize below my sense of the proposal regarding current changes to the criteria, as provided in Kim's memo.

Part A. Proposed Changes to Criterion 3.4.6. The proposed changes (in part within the criterion wording and in part in an associated Interpretive Statement) appear to have two components. First, it is proposed that the 1,950 AU total load requirement is replaced by a 4-year requirement, but with 4 years defined, in effect, so as to correspond to 1,950 AU's. Second, there is a clarification (within the associated Interpretive Statement) of what content may be used to contribute to the 405 AU's needed beyond the minimum specified components (mathematics, etc.) adding to 1,545 AU's.

Part B. Proposed "Housekeeping" Changes to Criteria. These changes relate to: (i) an articulation of the Graduate Attributes and Continual Improvement Criteria, (ii) a shift to "Procedures" of those items within Criteria 3.6 that are not criteria, and (iii) some other minor changes.

Part C. Proposed "Housekeeping" Changes to Procedures. These changes largely reflect the above shift to "Procedures" of those items within Criteria 3.6 that are not criteria.

KEY ISSUES

A number of issues that have been raised and that are relevant to this submission are summarized below (from my perspective).

¹ It is not clear how this and other feedback are to be taken into account, and by whom, in formulating specific recommendations for the EC Board's consideration. However, consistent with past practice, I have presumed that such recommendations will ultimately need to be endorsed and proposed by the CEAB in order to proceed to the EC Board for final approval.

1. ***Flexibility.*** There have been expressions of the need for criteria changes to allow for increased flexibility. There may be two aspects to this: one relates to the ability to deliver learning in different formats beyond traditional lecture courses; a second relates to the learning content that is provided. (A third aspect of flexibility, to some, refers to a reduction of total load requirements – this is reflected in item 3 below.) In my experience, while there is major flexibility with respect to both aspects, some clarification to both is desirable. The first aspect (learning formats) is not addressed in the current proposal, whereas my Recommendation 4 seeks to do so. The second aspect (learning content) is touched on in the proposed *Interpretive Statement*, whereas my Recommendation 3 seeks to do this more succinctly and with greater flexibility and clarity.
2. ***Institutional Workload.*** While institutional workload has been identified as a general issue, only those aspects relating to curriculum quantification are relevant here. This issue is not addressed in the current proposal, whereas my Recommendation 4 seeks to assist with this.
3. ***Program Dilution.*** An initial proposal called for the elimination of the 1,950 AU's total requirement, in effect implying that the total load requirement would be reduced to 1,545 AU's – that is a reduction corresponding to about 20% of the program. Fortunately, the Consultation Group saw fit not to recommend such a change, and instead proposed that the 1,950 AU total be retained, albeit indirectly via the introduction of a new 4-year requirement.
4. ***Process.*** The current ad-hoc process for formulating, consulting on and recommending criteria and other changes is very confusing, and does not provide the optimum environment for a meaningful consideration of long-term changes. Therefore, I propose that our community is not yet ready to examine alternative proposals for long-term changes, and that the August 2016 workshop focus instead on the development of a clear, inclusive, balanced and authoritative process for considering criteria and other changes in the future. (I propose to make a separate submission on this matter to the workshop.)

RECOMMENDATIONS

Based on the foregoing, I would like to make four recommendations at this time, each supported by a rationale.

Recommendation 1. I recommend that Part A (Proposed Changes to Criterion 3.4.6, and the associated Interpretative Statement) is abandoned.

Rationale: The proposed changes comprise of (i) replacing the 1,950 AU requirement by a 4-year requirement, but with 4 years defined, in effect, so as to correspond to 1,950 AU's; and (ii) a clarification of what content may be used to contribute to the 405 AU's beyond the specified components that add to a minimum of 1,545 AU's. The proposal has the following drawbacks:

- First, the proposal is simply a roundabout way of preserving the 1,950 AU's total requirement – needed in order to avoid a watering down of the program. Although this approach was initially devised in response to concerns expressed by Deans, I believe that the Deans appreciate that this change accomplishes nothing, but just re-casts the identical total load requirement in a needlessly complex way, now utilizing two measurement systems, but with no associated benefits. Since it brings zero benefits, but has more complicated language, why adopt it?

- The clarification of what content may contribute to the 405 AU's (beyond the specified components that add to a minimum of 1,545 AU's) also changes nothing. There is already no restriction on how these 405 AU's are counted. However, if considered desirable, such a clarification can easily be provided in a succinct, more flexible way by a short modification to Criterion 3.4.6. (Recommendation 3 below seeks to do so.)
- The proposal does nothing to address the perception (but not the reality) that inflexibility is causing most courses to be in traditional formats (of lectures, laboratories and tutorials), and that innovative ways of teaching are precluded. (Recommendation 4 below seeks to clarify this misperception.)
- Not least, the proposed Interpretive Statement is inappropriately written. First it contains a needless repetition of various criteria. Second it contains a statement of lofty intentions (e.g. "*The integrity and rigour of ... will not be compromised*"; "*There will be no dilution or reduction in the total learning requirement*") – that are well intentioned but simply do not belong in an Interpretive Statement. In the event that the Interpretive Statement is retained, it would need to be thoroughly re-written so as avoid repetition of the criteria and so as to be focussed on providing interpretations and elaborations of criteria wording.

Recommendation 2. I recommend that Part B ("housekeeping" changes to criteria) and Part C ("housekeeping" changes to procedures) be approved.

Rationale. These changes largely relate to an articulation of the Graduate Attributes and Continual Improvement Criteria (along with an Interpretive Statement that is referred to), and to a rationalization of Criteria 3.6, many of which are not in fact criteria at all. Both these changes were proposed by the CEAB some time ago, and it is important that they are approved as soon as possible – in part to bring much-needed clarity to the Graduate Attributes and Continual Improvement criteria.

Recommendation 3. I recommend that Criterion 3.4.6 be modified as shown below.

3.4.6 The program must have a minimum of 1,950 Accreditation units that are at a university level. **For clarification, the required 405 AU's beyond the minimum sub-total of 1,545 AU's arising from the five specified components (mathematics, natural sciences, complementary studies, engineering science and engineering design), may be assigned to **any** learning activity that is assigned academic credit, whether or not these conform to these specified components.**

Rationale. While the proposed Interpretive Statement seeks, in part, to address the use of the 405 AU's, that statement has other drawbacks, whereas the above statement seeks to do this more succinctly and with greater flexibility and clarity.

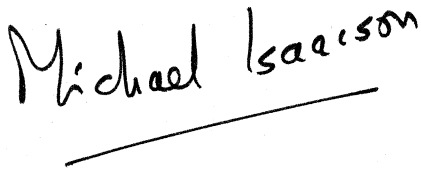
Recommendation 4. I recommend that Criterion 3.4.1 be modified as shown in the Appendix.

[I recognize that this is tantamount to a new proposal, and therefore this may not be given consideration at the present time.]

Rationale. The use and application of AU's and K-factors, as presently in place, sometimes leads to confusion with respect to the need for many courses with formal lectures / laboratories / tutorials, and their use also entails more workload than is necessary. By replacing the K-factor concept with a universal proportionality constant, the proposed change seeks to remove the current confusion, it emphasizes flexibility in learning formats, and it reduces the associated workload on the institution. At the same time, the proposal does not change the quantification of the curriculum in any significant way. It is emphasize that this recommendation relates to the near-term and does not preclude the consideration of future proposals relating to curriculum quantification over the long-term.

Thank you for the opportunity to provide this submission.

Yours sincerely,



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ADDENDUM – PROPOSED CHANGES TO CRITERION 3.4.1

The following update to Criterion 3.4.1 is proposed.

3.4.1 Approach and methodologies for quantifying curriculum content

Accreditation units (AU) are defined below so as to quantify the extent of student learning in any course that is granted academic credit. In this description, "course" is taken to denote all forms of learning activity that are granted academic credit. The number of AU's for each course is taken to be proportional to the academic credit granted by the institution.

An AU is defined by establishing first a "reference course" and its corresponding AU value using the following method: A reference course is an actual or hypothetical course that entails 3 hours per week of lectures (each corresponding to 50 minutes of activity) and no tutorial, laboratory or other contact hours over a nominal 13-week term. For such a course, the number of AU's = 3 hours × the number of weeks in place at the institution. In assessing the number of weeks, the actual instruction time exclusive of final examinations should be used.

Once the AU value of the reference course has been determined, a factor, F, is obtained as the number of AU's for the reference course divided by the number of units of academic credit defined by the institution for the same course. The number of AU's for every course in the program is then obtained by multiplying the number of academic units defined by the institution for that course by F.

The use of the reference course concept and the reliance on academic units assigned by the

institution, implies that all forms of learning activity in a program – including courses with or without scheduled laboratory or tutorial hours, significant design or research projects, and curriculum delivered through problem-based learning – may be readily quantified.

[Also delete Appendix 5 "Use of the K-factor".]

For reference, the current version of Criteria 3.4.1 is given below.

~~3.4.1 Approach and methodologies for quantifying curriculum content~~

~~3.4.1.1 Accreditation units (AU) are defined on an hourly basis for an activity which is granted academic credit and for which the associated number of hours corresponds to the actual contact time between the student and the faculty members, or designated alternates, responsible for delivering the program:~~

- ~~• one hour of lecture (corresponding to 50 minutes of activity) = 1 AU~~
- ~~• one hour of laboratory or scheduled tutorial = 0.5 AU~~

~~• This definition is applicable to most lectures and periods of laboratory or tutorial work. Classes of other than the nominal 50-minute duration are treated proportionally. In assessing the time assigned to determine the AU of various components of the curriculum, the actual instruction time exclusive of final examinations should be used.~~

~~3.4.1.2 For an activity for which contact hours do not properly describe the extent of the work involved, such as significant design or research projects, curriculum delivered through the use of problem-based learning, or similar work officially recognized by the institution as a degree requirement, an equivalent measure in accreditation units, consistent with the above definition, should be used by the institution.~~

~~3.4.1.3 One method for determining an equivalent measure in AU is a calculation on a proportionality basis. This method relies on the use of a unit of academic credit defined by the institution to measure curriculum content. Specifically, a factor, K, is defined as the sum of AU for all common and compulsory courses for which the computation was carried out on an hourly basis, divided by the sum of all units defined by the institution for the same courses.~~

~~Then, for each course not accounted for on an hourly basis, the number of AU is obtained by multiplying the units defined by the institution for that course by K.~~

$$K = \frac{\sum \text{AU for all common and compulsory courses for which the computation was carried out on an hourly basis}}{\sum \text{units defined by the institution for the same courses}}$$

[delete:]

~~3.4.1.4 The Accreditation Board can give consideration to departures from this approach and these methodologies in any case in which it receives convincing documentation that well-considered innovation in engineering education is in progress.~~