

## **Report to the Engineers Canada Board**

### **Proposed criteria changes for 2017-18 cycle**

August 2016

*Note: This report addresses a number of housekeeping changes to improve the clarity of the criteria and the short-term fix requested by the National Council of Deans of Engineering and Applied Science (NCDEAS) to provide flexibility in delivery of the 405 AU of additional Relevant Learning. The long term changes are outside the scope of this report.*

This report summarizes the options for the Engineers Canada Board to consider regarding

- proposed changes to criteria 3.4.6 to provide flexibility for educational innovation without impacting the overall quality of an engineering degree
- criteria changes of a “housekeeping” nature
- procedure changes to provide additional clarity regarding existing practices

### **Background**

Since 1996, curriculum content has been measured in accreditation units (AU). An AU is a measurement of activity between a student and a program instructor. One hour of lecture = 1 AU, one hour of laboratory or tutorial = 0.5 AU.

In April 2015, NCDEAS presented its position paper *Principles and Objectives of a Modernized Accreditation Process* which proposed long-term goals for the accreditation system as well as a transition step, which we refer to as the short-term goal.

Specifically, NCDEAS requested “As a transition, the NCDEAS proposes the amendment of “CEAB Criteria and Procedures” Articles 3.4.2 and 3.4.6 to a minimum of 1545 AUs to allow programs to renew curriculum and achieve graduate attributes.”

This would require reconsideration of the criteria related to the 405 AU of Additional Relevant Learning, leaving the 1545 AU of core engineering curriculum requirements (math, natural science, engineering science, engineering design, complementary studies) unchanged.

A consultation document with the proposed criteria changes and a draft interpretive statement were circulated to stakeholders. Engineers Canada engaged an independent consultant to conduct a survey of regulators, Accreditation Board members, and educators (deans and faculty) to gather comments on the proposed changes. The consultant conducted 39 interviews of 8 regulators, 11 Accreditation Board members and 20 educators. The information in this report reflects the results of the consultation.

The consultation document, consultant’s report and submissions received are available on the [Accreditation Consultation](#) section of the Engineers Canada website.

## Housekeeping and procedure changes

No concerns were received regarding the proposed criteria changes of a “housekeeping” nature or procedure changes to provide additional clarity regarding existing practices.

The Engineers Canada Board might therefore consider the following motion:

***THAT the proposed changes to criteria of a “housekeeping” nature and the procedure changes to provide additional clarity regarding existing practices be approved.***

### Proposed changes to criteria 3.4.6

In considering short-term changes to criteria, it is necessary to balance the requirements of stakeholders – regulators, HEIs, students and industry. In particular,

1. Regulators are assured that graduates from AB-accredited programs meet the academic requirements for licensure
2. Higher education institutions are able to deliver learning using progressive, modern teaching methods
3. Students are prepared to enter the workforce
4. Industry needs engineers that have both technical and “soft” skills

The options to achieve the short-term goal should be measured against the following three principles

1. Meets the regulators’ academic requirement for licensure
2. Provides for flexibility in teaching methods (not flexibility in content)
3. Provides clarity as to how teaching methods meet AU requirements (K-factor)

The table below describes two possible options to achieve the short-term goal that were identified through the consultation.

Criteria	Status Quo	Option 1	Option 2
3.4.6	The program must have a minimum of 1,950 accreditation units that are at a university level.	The program must have a minimum of four years of full-time (or equivalent) appropriate content at a university level.	The program must have a minimum of 1,950 accreditation units that are at a university level.
3.4.3 Mathematics and natural sciences	Minimum 420 AU	Minimum 420 AU	Minimum 420 AU
3.4.4	Minimum 900 AU	Minimum 900 AU	Minimum 900 AU

Engineering science and engineering design			
3.4.5 Complementary studies	Minimum 225 AU	Minimum 225 AU	Minimum 225 AU
Sub-total	1545 AU	1545 AU	1545 AU
3.4.2 Other requirements	Minimum 405 AU Current criteria are silent as to how this requirement can be met. <i>No interpretive statement.</i>	Additional relevant learning activity at a university level to meet the four year overall requirement. <i>Interpretive statement #1 (attached) provides that the additional relevant learning activity must be appropriate to engineering education approved by the HEI for academic credit.</i>	Minimum 405 AU of any learning activity that is assigned academic credit. <i>Interpretive statement #2 (attached) describes activities that meet the additional relevant learning requirement.</i>
Total	1950 AU	4 years or equivalent	1950 AU

### Assessment Status Quo and the Options against Principles

The table below compares the status quo with the two possible options to achieve the short-term goal that were identified through the consultation. The status quo does not meet one of the principles “Provides clarity as to what delivery methods are acceptable” as the criteria are silent in this regard.

Criteria	Status Quo	Option 1	Option 2
3.4.6	The program must have a minimum of 1,950 accreditation units that are at a university level.	The program must have a minimum of four years of full-time (or equivalent) appropriate content at a university level.	The program must have a minimum of 1,950 accreditation units that are at a university level.
Meets regulators’ academic requirement for licensure	Yes. The core engineering curriculum requirements (math, natural science, engineering science, engineering design, complementary studies) and the requirement for	Yes. The core engineering curriculum requirements (math, natural science, engineering science, engineering design, complementary studies) and the requirement for	Yes. The core engineering curriculum requirements (math, natural science, engineering science, engineering design, complementary studies) and the requirement for

	licensure of faculty will remain unchanged.	licensure of faculty will remain unchanged.	licensure of faculty will remain unchanged.
Flexibility in teaching methods (not flexibility in content)	Yes. However, there is no criteria or interpretive statement that restricts how 405 AU of additional relevant learning can be met.	Yes. Interpretive statement describes how 405 AU of additional relevant learning can be met.	Yes. Interpretive statement describes how 405 AU of additional relevant learning can be met.
Provides clarity as to what teaching methods are acceptable	No, criteria are silent.	Yes. Interpretive statement describes how 405 AU of additional relevant learning can be met.	Yes. Minimum 405 AU of any learning activity that is assigned academic credit.

The Accreditation Board remains of the view that the flexibility in teaching methods sought by NCDEAS can be achieved under the current criteria with use of the K-factor. However, it appears that clarity is required as to what teaching methods will be “counted” and how they are “calculated”. HEIs require certainty that teaching methods will be acceptable prior to implementation.

*Note: HEIs may use the significant change process to request confirmation from AB that new teaching methodologies are acceptable. The HEI should submit a notice of proposed significant change and request confirmation from AB that the proposed change will not impact on accreditation.*

**The Engineers Canada Board might therefore consider the following motion:**

***THAT the accreditation criteria be amended to reflect Option 1 or 2.***

### Option 1: Interpretive Statement #1

An engineering program is comprised of at least four years of full-time (or equivalent) study at a university level comprised of:

Minimum Curriculum Content	
Mathematics and natural sciences Mathematics: Minimum 195 AU Natural sciences: Minimum 195 AU	Minimum 420 AU
Engineering science and engineering design Engineering science: Minimum 225 AU Engineering design: Minimum 225 AU	Minimum 900 AU
Complementary Studies (see note 1)	Minimum 225 AU
Additional relevant learning activity at a university level to meet the four year overall requirement (equivalent to 405 AU). The additional relevant learning activity must be appropriate to engineering education approved by the HEI for academic credit. (see note 2)	--
Laboratory experience and safety procedures instruction	--

The Accreditation Board accepts the following methods to quantify four years of program content:

1. The continued use of accreditation units with a minimum total of 1950 AU.
2. The total HEI's academic credits for the program is not less than any engineering program currently accredited at the HEI and the academic credits reflect the minimum curriculum content.
3. The use of the HEI's equivalent institutional academic credits.

### Principles

1. The integrity and rigour of a four-year engineering degree in terms of content and quality will not be compromised.
2. There will be no dilution or reduction in the total learning requirement.
3. The performance of individual students in all learning activities making up the curriculum must be appropriately evaluated for the assignment of academic credit.
4. The requirements for curriculum content and quality must be satisfied by all students ("minimum path" concept).

### Measurement of program content

- The Accreditation Board will continue to require expression of compulsory components of curriculum content in terms of accreditation units (AU).
- CEGEP prior studies at a university level will be considered up to 225 AU (as defined in the transfer credit regulations).

**Note 1: Complementary studies may include, but are not limited to:**

- engineering economics
- the impact of technology on society
- humanities and social sciences
- oral and written communications
- health and safety
- professional ethics
- equity and law
- sustainable development and environmental stewardship

**Note 2: Additional learning activities may include, but are not limited to:**

- management or business studies
- entrepreneurship, including engineering entrepreneurship
- active independent learning (project & problem-based; directed research, etc.)
- international learning experiences
- additional content in the defined curriculum categories for accreditation
- appropriate post degree courses

## Option 2: Interpretive Statement #2

An engineering program must have a minimum of 1,950 accreditation units that are at a university level.

Minimum Curriculum Content	
Mathematics and natural sciences Mathematics: Minimum 195 AU Natural sciences: Minimum 195 AU	Minimum 420 AU
Engineering science and engineering design Engineering science: Minimum 225 AU Engineering design: Minimum 225 AU	Minimum 900 AU
Complementary Studies (see note 1)	Minimum 225 AU
405 AU's of any learning activity that is assigned academic credit (see note 2)	n/a
Laboratory experience and safety procedures instruction	n/a

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