

To: Stakeholders of Accreditation of Engineering Programs in Canada
From: Kim Allen, CEO
Re: Consultation on Proposed Accreditation Criteria 2016
Date: May 19, 2016

This round of consultation only deals with the changes in accreditation criteria for the 2017-18 cycle. To deal with issues beyond the scope of this consultation we are hosting a Forum on Accreditation on August 17-18, 2016 in Toronto. To ensure we consider all issues at the Forum, we invite you to provide comments through the [online survey](#).

For 50 years, the accreditation of engineering academic programs in Canada has ensured high standards in engineering education. Graduates of accredited programs meet the academic requirements for licensure. Programs accredited in 2015 included the assessment of graduate attributes for the first time. Accreditation will continue to examine all components shown in the diagram below. Detailed information is provided in the [Accreditation Criteria and Procedures Report](#).

3.1 Graduate Attributes (program effective in stimulating students to learn)		
3.4 Curriculum Content & Quality (minimum technical body of knowledge)		
3.4.5.1 Additional Relevant Learning (minimum complementary body of knowledge)		
3.3 Student Support (policies & procedures that address admission, counselling, promotion, graduation)	3.5 Program Environment (facilities, faculty, financial resources)	3.2 Continual Improvement (outcomes assessed, learnings applied)

This consultation is related to the measurement of *Curriculum Content and Quality*, procedure changes and to provide additional clarity regarding existing practice.

Since 1996, curriculum content has been measured in accreditation units (AU). An AU is a measurement of activity between the student and program instructor (i.e. “contact hours” - one hour of lecture = 1 AU, one hour of laboratory or scheduled tutorial = 0.5 AU).

In April 2015, the National Council of Deans of Engineering and Applied Science (NCDEAS) advocated for flexibility in educational innovation, without impacting the overall quality of an engineering degree. The NCDEAS requested that Engineers Canada consider criteria changes related to the 405 AU of *Additional Relevant Learning*. The 1545 AU set out in criteria 3.4.2 would remain unchanged.

We have retained Georges Lozano, MPA, CAE to conducted interviews with interested stakeholders. Please contact Georges at geolozano@rogers.com (613) 731-7372 to set up a time for the interview.

WHAT WE'VE HEARD

Major Themes from Initial Consultation	Adjustments Made
An accredited degree must continue to meet the regulators' academic requirement for licensure.	Remains as the purpose of accreditation in Canada.
A set of overarching principles is needed.	<p>All of the proposed changes comply with the following overarching principles</p> <ul style="list-style-type: none"> • the overall quality of the engineering degree will remain unchanged or improve • engineering programs will continue to be four years, or equivalent • the core engineering curriculum requirements (math, natural science, engineering science, engineering design, complementary studies) and the requirement for licensure of faculty will remain unchanged
Flexibility for educational innovation can be achieved with an <i>Interpretative Statement</i> that provides guidance regarding measurement of the 405 AU of <i>Additional Relevant Learning</i> .	An Interpretive statement explaining the flexible methods to measure curriculum components will be part of the criteria. The Interpretive Statement is a living document and will reflect additional methods as they emerge.
Eliminating the 1950 AU requirement will reduce the content in the engineering programs. Stating "four years" is simply a measurement of time, not a standard for curriculum content (it's easy to design a 4-year, 8-semester curriculum with 5 courses per semester, a standard honors degree, that meets the minimum component-specified 1,545 AU).	An Interpretive Statement that provides clarity that the overall quality of an engineering degree will remain unchanged or improve will be part of the criteria. The draft is provided as part of the consultation.
The current system provides the Deans with all the flexibility they are requesting regarding the additional 405 AU and much more. K-factor provides an easy means to calculate AU for courses that do not follow the traditional lecture/lab format. Many HEIs have successfully used the K-factor. The current system accredits a 100% problem-based curriculum at L'Université de Sherbrooke.	The Interpretive statement that explains K-factor and other methods to measure curriculum components will be part of the criteria.
A standard is more transparent and explicit, especially for the regulators. The <u>standard</u> should be 1,950 AU, while the methods of how to meet the standard is the purview of a <u>guideline</u> .	See above

Major Themes from Initial Consultation	Adjustments Made
<p>The initial consultation process was less than adequate (too rushed, lack of clarity, etc.).</p>	<p>This round of consultation is focused on the changes in accreditation criteria for the 2017-18 cycle only. There is 60 days of formal consultation. Once the consultation has concluded there is an additional 75 day before the Engineers Canada Board makes a decision on the proposed criteria changes.</p> <p>Inputs on other changes are welcome and will be discussed by the stakeholders at the Accreditation Forum.</p>
<p>Comments beyond the scope of the consultation have identified needs:</p> <ul style="list-style-type: none"> • articulate a clear vision of the future of accreditation • address the workload of the AB and AB visitors • address the workload of the HEIs • provide regular review of accreditation criteria • develop an effective consultation and decision protocol • provide more flexibility for educational innovation 	<p>We are hosting a Forum on Accreditation on August 17-18, 2016 in Toronto to deal with long term matters beyond the scope of this consultation.</p> <p>All of the stakeholders will be invited to attend the Forum. The details of the forum will be published in May 2016.</p> <p>We invite you to provide comments through the online survey.</p>

CONSULTATION DOCUMENT ON PROPOSED CRITERIA CHANGES 2016

We are seeking comments, feedback and input from all stakeholders on proposed changes to accreditation criteria for the 2017-18 cycle. The attached summary sets out the changes to accreditation criteria under consideration. The document lists the changes and the rationale for the changes.

PART A: criteria changes to provide flexibility for educational innovation without impacting the overall quality of an engineering degree.

PART B: criteria changes of a “housekeeping” nature. Items that are policies and/or procedures are moved to Section 4, which is renamed as *Accreditation policies and procedures*. The requirement for licensure for the curriculum committee is aligned with the requirements for licensure in other parts of the criteria.

PART C: procedure changes to provide additional clarity regarding existing practice.

CONSULTATION RESOURCES

Available on the [consultation site](#) are:

- The comprehensive consultation document *Consultation on Engineering Instruction and Accreditation*
- A “clean” copy of the accreditation criteria renumbered with the proposed changes
- Additional background material

DECISION

After consideration of the feedback from stakeholders, the Engineers Canada Board will make a decision regarding approval of the proposed changes at its September 2016 meeting.

Please send your comments to consultation@engineerscanada.ca by July 15, 2015.

Thank you.

PART A – Proposed changed to criteria 3.4.6 Minimum Program Content

This proposed change is intended to provide institutions with more flexibility for educational innovation while ensuring that the overall quality of an engineering degree will remain unchanged or improve.

Proposed change is to criteria 3.4.6

Current	Proposed
3.4.6 The program must have a minimum of 1,950 Accreditation units that are at a university level.	3.4.6 Minimum Program Content The program must have a minimum of four years of full-time (or equivalent) appropriate content at a university level. An Interpretive Statement on minimum program content is attached as an appendix to this document.

Interpretive Statement on proposed criteria 3.4.6 – Draft for consultation purposes

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

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)	n/a
Laboratory experience and safety procedures instruction	n/a

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

- The continued use of accreditation units with a minimum total of 1950 AU.
- The use of the HEI's equivalent institutional academic credits.

Principles

- The integrity and rigour of a four-year engineering degree in terms of content and quality will not be compromised.
- There will be no dilution or reduction in the total learning requirement.
- 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

PART B – PROPOSED “HOUSEKEEPING” CHANGES

The Accreditation Board has performed an overall review of criteria, and is proposing the following changes that are of a “housekeeping” nature.

Proposed Changes	Rationale
<p>3.1 Graduate attributes The institution must demonstrate that the graduates of a program possess the attributes under the following headings. [The attributes will be interpreted in the context of candidates at the time of graduation. It is recognized that graduates will continue to build on the foundations that their engineering education has provided.]</p>	<p>Verbatim [text] will follow the renumbered attribute list 3.1.1 to 3.1.12.</p>
<p>3.1.9 Impact of engineering on society and the environment: An ability to analyze societal and environmental aspects of engineering activities. Such ability includes an understanding of the interactions that engineering has with the economic, social health, safety, legal, and cultural aspects of society, the uncertainties in the prediction of such interactions and the concepts of sustainable design and development and environmental stewardship.</p>	<p>Minor editorial change</p>
<p>To assess the suitability of a program for developing the above list of attributes, the Accreditation Board will rely on criteria 3.1.1 to 3.1.5, given below, and on the <i>Interpretive Statement on Graduate Attributes</i> which is attached as an appendix to this document.</p>	<p>Introductory sentence and identifying that the <i>Interpretive Statement on Graduate Attributes</i> is available.</p>
<p>3.1.1 Organization and engagement: There must be demonstration that an organizational structure is in place to assure the sustainable development and measurement of graduate attributes. There must be demonstrated engagement in the processes by faculty members and engineering leadership.</p>	<p>Clarity regarding organization and engagement.</p>
<p>3.1.2 Curriculum maps: There must be documented curriculum maps showing the relationship between learning activities for each of the attributes and the semesters in which these take place.</p>	<p>Clarity regarding curriculum maps showing the relationship between learning activities.</p>
<p>3.1.3 Indicators: For each attribute, there must be a set of measurable, documented indicators that describe what students must achieve in order to be considered competent in the corresponding attribute.</p>	<p>Clarity regarding the indicators for the achievement of each attribute.</p>
<p>3.1.4 Assessment Tools: There must be documented assessment tools that are appropriate to the attribute and used as the basis for obtaining data on student learning with respect to all twelve attributes over a cycle of six years or less.</p>	<p>Clarity regarding the assessment tools used.</p>
<p>3.1.5 Assessment Results: At least one set of assessment results must be obtained for all twelve attributes over a cycle of six years or less. The results should provide clear evidence that graduates of a program possess</p>	<p>Clarity regarding that the results must provide clear evidence for each attribute.</p>

Proposed Changes	Rationale
the above list of attributes.	
<p>3.2 Continual improvement Engineering programs are expected to continually improve. There must be processes in place that demonstrate that program outcomes are being assessed in the context of the graduate attributes, and that the results are applied to the further development of the program. To evaluate this criterion, the Accreditation Board will rely on criteria 3.2.1 to 3.2.3 given below and on the <i>Interpretive Statement on Continual Improvement</i>, which is attached as an appendix to this document.</p>	Detailed criteria have been added to regarding the program outcomes that are being assessed in the context of the graduate attributes, and that the results are applied to the further development of the program.
<p>3.2.1 Improvement process: There must be processes in place that demonstrate that program outcomes are being assessed in the context of the graduate attributes, and that the results are validated, analyzed and applied to the further development of the program.</p>	New criteria to provide clarity on the expectations regarding process improvement.
<p>3.2.2 Stakeholder engagement: There must be demonstrated engagement and involvement of stakeholders both internal and external to the program in the continual improvement process.</p>	New criteria to provide to clarity on the expectations regarding stakeholder engagement.
<p>3.2.3 Improvement actions: There must be a demonstration that the continual improvement process has led to consideration of specific actions corresponding to identifiable improvements to the program and/or its assessment process. This criterion does not apply to the evaluation of new programs.</p>	New criteria to provide clarity on the expectations regarding improvement actions.
<p>3.2 Students Accredited programs must have functional policies and procedures that deal with quality, admission, counselling, promotion and graduation of students. Although all accreditation criteria connect directly and indirectly with their education, particular attention is drawn to admission, promotion and graduation, and academic advising counselling and guidance.</p>	Minor editorial change
<p>3.3.2 Promotion and graduation: There must be documented p Processes and policies for promotion and graduation of students must be documented. The institution must verify that all students have met all its regulations for graduation in the program identified on the transcript and that the curriculum followed is consistent with that of the accredited program. The program name must be appropriate for all students graduating from the program.</p>	Minor editorial change
<p>3.3.3. Counselling and guidance Academic Advising: There must be processes and sufficient resources in place for the academic advising of students. Clear statements of such policies or procedures should be available to faculty and students. Depending</p>	Added text to isolate and clarify academic advising expectations. Non-academic counselling and guidance is moved to section

Proposed Changes	Rationale
<p>on the governance structures in place, aspects of student advising should normally be at both the program and Faculty levels.</p>	3.5.1.2
<p>3.4.2 Minimum curriculum components: An engineering program must include the following minima minimum for the entire curriculum and for each of its components. * The entire program must include a minimum of 1,950 AU Engineering science and engineering design: Minimum 900 AU <i>Which includes a minimum 225 AU in each of Engineering science and Engineering design</i> Mathematics and natural sciences: Minimum 420 AU <i>Which includes a minimum 195 AU in each of Mathematics and Natural sciences.</i> Complementary Studies: Minimum 225 AU Laboratory experience and safety procedures instruction</p>	Change to accommodate new definition of total program load and provide HEIs with more flexibility for educational innovation while ensuring that the overall quality of the engineering degree will improve or remain unchanged. Criteria 3.4.6 has been amended to ensure the quality remains the same or <u>improves</u> .
<p>3.4.5 A minimum of 225 AU of complementary studies: Complementary studies include humanities, social sciences, arts, management, engineering economics and communications that to complement the technical content of the curriculum.</p>	Minor editorial change
<p>c. Professionalism, ethics, equity and law g. Engineering economics and project management</p>	Minor editorial changes to better align with terminology used in graduate attributes in Section 3.1
<p>3.5.1.2 The quality, suitability, and accessibility of the: a. laboratories b. library c. computing facilities d. non-academic counselling and guidance e. other supporting facilities and services</p>	Minor editorial changes. Non-academic counselling and guidance added - see section 3.3.3 <i>Academic advising</i> "facilities and services" amended for completeness
<p>3.5.3. Leadership: The dean of engineering (or equivalent officer) and the head of an engineering program (or equivalent officer with overall responsibility for each engineering program) are expected to provide effective leadership in engineering education and to have high standing in the engineering community. They are expected to be engineers licensed to practice engineering in Canada, preferably in the jurisdiction in which the institution is located. In those jurisdictions where the teaching of engineering is the practice of engineering, the officers are expected to be engineers licensed in that jurisdiction in which the institution is located. To evaluate this criterion, the Accreditation Board will rely on the Interpretive statement on licensure expectations and requirements, which is attached as an appendix to this document.</p>	Alignment of the licensure requirement language. The deleted text is a regulatory requirement not a program quality criterion.
<p>3.5.4 Expertise and competence of faculty: Faculty delivering the engineering curriculum are expected to have a high</p>	Letter labels added to simplify referencing of specific issues

Proposed Changes	Rationale
<p>level of expertise and competence, and to be dedicated to the aims of engineering education and of the self-regulating engineering profession, which will be judged by the following factors:</p> <ul style="list-style-type: none"> a. The level of academic education of its members. b. The diversity of their backgrounds, including the nature and scope of their non-academic experience. c. Their ability to communicate effectively. Their experience in teaching, research and design practice. d. Their experience and accomplishments in teaching, research and/or engineering practice. Their level of scholarship as shown by scientific, engineering, and professional publications. e. Their degree of participation in professional, scientific, engineering, and learned societies. Their personal interest in, and documented support of the curriculum and program related extra-curricular activities. f. Their appreciation of the role and importance of the self-regulating engineering profession, and of positive attitudes towards professional licensure and involvement in professional affairs. 	<p>“Their” in the subsequent list applies to individual faculty members</p> <p>For individuals experience in engineering practice and/or research is required (but the Faculty as a whole must demonstrate both)</p> <p>Deleted text is redundant - implied by a. and d. above</p>
<p>3.5.8 Curriculum committee: Engineering program curriculum changes are expected to be overseen by a formally structured curriculum committee. The majority of the voting members of the committee are expected to be licensed professional engineers to practice engineering in Canada. preferably in the jurisdiction in which the institution is located. In those jurisdictions where the teaching of engineering is the practice of engineering, they are expected to be licensed in that jurisdiction.</p>	<p>Minor editorial change</p> <p>Aligned with licensing requirement in 3.5.7.</p> <p>The deleted text is a regulatory requirement not a program quality criterion.</p>
<p>Section 3.6 is renamed as <i>Additional criteria</i>. Items that are policies and/or procedures are moved to Section 4, which is renamed as <i>Accreditation policies and procedures</i></p>	
<p>3.6 Accreditation procedures and application Additional Criteria</p>	
<p>3.6.1 Accreditation applies only to programs, not to departments or faculties. For purposes of accreditation, a program is characterized by a formally approved and published curriculum that is regarded as an entity by the institution and that can be considered independently. All options in the program are examined. Following the principle that a program is only as strong as its weakest link", a program is accredited only if all such options meet the criteria.</p>	<p>3.6.1 moved to section 4.1 3.6.4 becomes 3.6.1 with a minor editorial change</p>
<p>3.6.2 Application of the accreditation process to an engineering program is undertaken only at the invitation of a particular institution and with the consent of the appropriate regulator. An accredited program must have the word “engineering” in its title.</p>	<p>3.6.2 deleted - made redundant by Section 4.1 3.6.5 becomes 3.6.2</p>
<p>3.6.3 The accreditation process comprises two parts: program evaluation</p>	<p>3.6.3 moved to section 4</p>

Proposed Changes	Rationale
<p>by a visiting team and accreditation decision by the Accreditation Board. The evaluation of the program is based on detailed data provided by the institution and on the collective opinion of the members of the visiting team. The accreditation decision is made by the Accreditation Board based on qualitative and quantitative considerations. The title of an accredited engineering program must be properly descriptive of the curriculum content.</p>	<p>3.6.6 becomes 3.6.3</p>
<p>3.6.4 For purposes of accreditation, a program is characterized by a formally approved and published curriculum that is regarded as an entity by the institution and that can be considered independently. All options in the program are examined. Following the principle that a program is only as strong as its “weakest link”, a program is accredited only if all such options meet the criteria. If a program, by virtue of its title, becomes subject to the content requirements for two or more engineering curricula, then the program must meet the Accreditation Board requirements for each engineering curriculum named.</p>	<p>3.6.4 becomes 3.6.1 3.6.7 becomes 3.6.4</p>
<p>3.6.5 An accredited program must have the word “engineering” in its title. The Accreditation Board must have evidence that all engineering options contain a significant amount of distinct curriculum content and that the name of each option is descriptive of that curriculum content. An <i>Interpretive statement on curriculum content for options and dual-discipline programs</i> is attached as an appendix to this document.</p>	<p>3.6.5 becomes 3.6.2 3.6.9 becomes 3.6.5</p>
<p>3.6.6 The title of an accredited engineering program must be properly descriptive of the curriculum content. The Accreditation Board must have evidence that the program name is appropriate for all students graduating in the program regardless of the option taken.</p>	<p>3.6.6 becomes 3.6.3 3.6.10 becomes 3.6.6</p>
<p>3.6.7 to 3.6.13 3.6.7 becomes 3.6.4 3.6.8 moved to Section 4.1 3.6.9 becomes 3.6.5 3.6.10 becomes 3.6.6 3.6.11 moved to Section 4.1 3.6.12 deleted - made redundant by Section 4.6.1 3.6.13 moved to Section 4.7 3.6.14 moved to Section 4.6.5</p>	

PART C – PROPOSED CHANGES TO PROCEDURES

These proposed changes are intended to provide additional clarity regarding existing practices. Most of the changes result from moving policies and procedures that were in the criteria section to this section.

Proposed Changes	Rationale
<p>4. Procedures Accreditation policies and procedures</p>	<p>Title change</p>
<p>The accreditation process comprises two parts: program evaluation by a visiting team and accreditation decision by the Accreditation Board. The evaluation of the program is based on detailed data provided by the institution and on the collective opinion of the members of the visiting team.</p> <p>The accreditation decision is made by the Accreditation Board based on qualitative and quantitative considerations, including the program’s responses or clarifications to the visit report.</p>	<p>Moved from 3.6.3</p> <p>Additional text to provide clarity</p>
<p>4.1 Initiation and timing of accreditation visit</p> <p>An accreditation assessment is initiated only at the invitation of an institution and with the consent of the appropriate member of Engineers Canada.</p> <p>Accreditation applies only to programs, not to departments or faculties.</p> <p>The Accreditation Board does not evaluate or accredit non-engineering degrees, diplomas, or certificates or components thereof; only the engineering degree will be listed in the annual report section on accredited engineering programs.</p> <p>An accreditation visit to assess or reassess an engineering program or programs normally takes place in October or November. A request from the institution for such a visit must be received by the Accreditation Board Secretariat by January 1 of the calendar year in which the visit is to take place.</p> <p>Accreditation of a program is granted only after students have graduated from the program. For new programs, an accreditation visit may be undertaken in the final year of the first graduating class.</p>	<p>This makes 3.6.2 redundant</p> <p>Moved from 3.6.1</p> <p>Moved from 3.6.8</p> <p>Moved from 3.6.11</p>
<p>An accreditation visit to assess or reassess an engineering program or programs normally takes place in October or November. A request from the institution for such a visit must be received by the Accreditation Board Secretariat by January 1 of the calendar year in which the visit is to take place. Accreditation of a program is granted only after students have graduated from the program. For new programs, an accreditation visit may be undertaken in the final year of the first graduating class.</p>	

Proposed Changes	Rationale
<p>4.6.1 Accreditation of a program is granted for a specific term, the maximum being is six years. Any term of accreditation may be conditional upon the institution satisfying one or more requirements. . . .</p>	<p>This makes 3.6.12 redundant Minor editorial change</p>
<p>4.6.5 The Accreditation Board reserves the right to alter the accreditation status of any program at any institution if it is discovered that such program is not in compliance with any of the Accreditation Board's accreditation criteria or regulations.</p>	<p>3.6.14 becomes 4.6.5 with minor editorial change</p>
<p>4.7 Formal review Significant change</p>	<p>3.4.13 becomes 4.7</p>
<p>4.8 Informal evaluation or visit Formal review</p>	<p>4.7 becomes 4.8</p>
<p>4.9 Publication Informal evaluation or visit</p>	<p>4.8 becomes 4.9</p>
<p>4.10 Publication</p>	<p>4.9 becomes 4.8</p>