

TO: Engineering Technology Colleagues

FROM: Engineering Technology Accreditation Commission Criteria Committee

SUBJECT: First Draft of Changes to ETAC General Criteria 3 & 5

The first draft of revisions to ETAC General Criteria 3 and 5 submitted by the Criteria Committee has been approved by the Executive Committee and will be submitted to the full commission during the July meeting. If approved by the commission, the criteria changes will be submitted to the Engineering Technology Area Delegation (ETAD) for its approval. Changes approved by ETAD will go forward for inclusion in the changes section of the next *Criteria for Accrediting Engineering Technology Programs* and for public comment in accordance with the *Accreditation Policy and Procedures Manual*.

The draft revisions recognize the need to improve the current processes in engineering technology programs to: (1) more effectively define and improve their continuous improvement efforts, and (2), to incorporate wording from the Dublin Accords within the ETAC Criteria, that will increase the mobility of our graduates in a global economy.

In reading the draft, you will note two significant revisions in Criteria 3, Student Outcomes: (1) consolidation of some of the subparagraphs a-i/k into five specific capabilities, and, (2) the reintroduction of the design requirement into the two-year program criteria. It should be noted that the elements within the a-i/k that were not incorporated within the five specific capabilities have been incorporated into Criterion 5, Curriculum.

A key element in this draft is the reintroduction of the 'design' component within the 2-year program criteria. In 2011, this component was removed from the ETAC criteria but is being reintroduced as Criterion 3.A.(2), to strengthen compliance with the graduate attributes of the Dublin Accord, and as stated above, to increase the mobility of our graduates in a global economy. Initial checks with several 2-year programs have shown no great concern over adding design back into the criteria. Upon final approval of these proposed revisions, the five specific capabilities outlined in Criterion 3, Student Outcomes, for both the 4-year and 2-year programs must be incorporated in a program's student outcomes and assessed on a regular basis. Because the requirements of 1 – 5 are included in a-k, baccalaureate programs will not be required to change their student outcomes. However, programs that adopt the new 1 – 5, will see a reduced assessment burden. This is especially true with the essentially unmeasurable items from the current student outcomes requirements, which have been incorporated within Criterion 5, and which must be specifically covered in the curriculum. However, there is no requirement to assess these elements under the requirements of Criterion 4. Associate degree programs would be required to add design to their student outcomes, but otherwise could also reap the benefits of the reduced assessment.

In accordance with a newly approved program criteria template, professional societies may supplement the requirements of Criteria 5, Curriculum, and 6, Faculty, to add specificity and to differentiate their disciplines. By defining the skills, knowledge, and tools of the discipline in the curriculum, a society does not increase the assessment requirements its programs; it merely focuses them to the discipline.

Members of ETAC criteria committee will attend the 2017 ASEE Annual Conference in Columbus, OH. There is a session, T599, sponsored by ABET on Tuesday, June 27, at 3:15 where a preview of the draft proposed changes in Criteria 3 & 5 will be presented.

For the Engineering Technology Accreditation Commission Criteria Committee:

A handwritten signature in black ink, appearing to read "T.M. Hall, Jr.", with a long, sweeping flourish extending downwards and to the right.

Thomas M. Hall, Jr.
Chair
Email: hallt@nsula.edu

ENGINEERING TECHNOLOGY ACCREDITATION COMMISSION
General Criteria

ETAC Criteria Currently in Use	Draft - ETAC Criteria Proposed for First Reading
<i>Criterion 3. Student Outcomes</i>	<i>Criterion 3. Student Outcomes</i>
The program must have documented student outcomes that prepare graduates to attain the program educational objectives. There must be a documented and effective process for the periodic review and revision of these student outcomes.	The program must have documented student outcomes that prepare graduates to attain program educational objectives. There must be a documented and effective process for periodic review and revision of these student outcomes.
For purposes of this section, <u>broadly defined</u> activities are those that involve a variety of resources; that involve the use of new processes, materials, or techniques in innovative ways; and that require a knowledge of standard operating procedures. <u>Narrowly defined</u> activities are those that involve limited resources, that involve the use of conventional processes and materials in new ways, and that require a knowledge of basic operating processes.	For purposes of this section, <u>well-defined</u> activities or problems involve limited resources; use conventional processes and materials in new ways; and require knowledge of standard operating processes. <u>Broadly defined</u> activities involve a variety of resources; use new processes, materials, or techniques in innovative ways; and may require extension of standard operating procedures.
A. For associate degree programs, these student outcomes must include, but are not limited to, the following learned capabilities:	A. For associate degree programs, student outcomes must include, but are not limited to, the following:
a. an ability to apply the knowledge, techniques, skills, and modern tools of the discipline to narrowly defined engineering technology activities;	(1) an ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve well-defined engineering problems appropriate to the discipline;
b. an ability to apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require limited application of principles but extensive practical knowledge;	Included in (1) and in Criterion 5, Curriculum.
No direct equivalent in current ETAC criteria—“design” added from the International Engineering Alliance (IEA) Dublin Accords Graduate Attribute DA3 ¹ .	(2) an ability to design solutions for well-defined technical problems and assist with engineering design of systems, components, or processes appropriate to the discipline;

¹ **DA3:** Design solutions for *well-defined technical problems* and assist with the design of systems, components or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

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c. an ability to conduct standard tests and measurements, and to conduct, analyze, and interpret experiments;	(3) an ability to conduct standard tests, measurements, and experiments and to analyze and interpret the results;
d. an ability to function effectively as a member of a technical team;	(4) an ability to function effectively as a member of a technical team;
e. an ability to identify, analyze, and solve narrowly defined engineering technology problems;	Included in (1) and (2).
f. an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;	(5) an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;
g. an understanding of the need for and an ability to engage in self-directed continuing professional development;	Moved to Criterion 5, Curriculum paragraph 1.
h. an understanding of and a commitment to address professional and ethical responsibilities, including a respect for diversity; and	Incorporated in (2) and under Criterion 5, Curriculum, Technical Content.
i. a commitment to quality, timeliness, and continuous improvement.	Moved to Criterion 5, Curriculum, Technical Content.
B. For baccalaureate degree programs, these student outcomes must include, but are not limited to, the following learned capabilities:	B. For baccalaureate degree programs, student outcomes must include, but are not limited to, the following:
a. an ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to broadly-defined engineering technology activities;	(1) an ability to apply knowledge, techniques, skills, and modern tools of mathematics, science, engineering, or technology to solve broadly-defined engineering problems;
b. an ability to select and apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies;	Included in (1) and in Criterion 5, Curriculum.
c. an ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes;	(3) an ability to conduct standard tests, measurements, and experiments and to analyze and interpret the results to improve processes;

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d. an ability to design systems, components, or processes for broadly-defined engineering technology problems appropriate to program educational objectives;	(2) an ability to design systems, components, or processes meeting specified needs for broadly-defined engineering problems;
e. an ability to function effectively as a member or leader on a technical team;	(4) an ability to function effectively as a member or leader on a technical team;
f. an ability to identify, analyze, and solve broadly-defined engineering technology problems;	Included in (1)
g. an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;	(5) an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;
h. an understanding of the need for and an ability to engage in self-directed continuing professional development;	Moved to Criterion 5, Curriculum paragraph 1.
i. an understanding of and a commitment to address professional and ethical responsibilities including a respect for diversity;	Incorporated in (2) and under Criterion 5, Curriculum, Technical Content.
j. a knowledge of the impact of engineering technology solutions in a societal and global context; and	Incorporated in (2) and under Criterion 5, Curriculum, Technical Content.
k. a commitment to quality, timeliness, and continuous improvement.	Moved to Criterion 5, Curriculum, Technical Content.
Criterion 5. Curriculum	Criterion 5. Curriculum – Proposed
The curriculum must effectively develop the following subject areas in support of student outcomes and program educational objectives.	Curricular requirements specify topics appropriate to engineering technology but do not prescribe courses. The curriculum must combine technical, professional and general education components in support of student outcomes to prepare students for a career, further study, and lifelong professional development. To differentiate the discipline, Program Criteria may add specificity for program curricula. The curriculum must include the following:
<u>Mathematics</u> The program must develop the ability of students to apply mathematics to the solution of technical problems.	<u>Mathematics</u> The program must develop the ability of students to apply mathematics to the solution of technical problems.

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<p>a. Associate degree programs will, at a minimum, include algebra and trigonometry at a level appropriate to the student outcomes and program educational objectives.</p>	<p>a. Associate degree programs will, at a minimum, include algebra and trigonometry at a level appropriate to the student outcomes and the discipline.</p>
<p>b. Baccalaureate degree programs will include the application of integral and differential calculus or other mathematics above the level of algebra and trigonometry appropriate to the student outcomes and program educational objectives.</p>	<p>b. Baccalaureate degree programs will include the application of integral and differential calculus or other mathematics above the level of algebra and trigonometry appropriate to student outcomes and discipline.</p>
<p><u>Technical Content</u> The technical content of the program must focus on the applied aspects of science and engineering and must:</p>	<p><u>Technical Content</u> The technical content of the program must focus on the applied aspects of science and engineering and must:</p>
<p>a. Represent at least 1/3 of the total credit hours for the program but no more than 2/3 of the total credit hours for the program.</p> <p>b. Include a technical core that prepares students for the increasingly complex technical specialties they will experience later in the curriculum.</p> <p>c. Develop student competency in the use of equipment and tools common to the discipline.</p>	<p>a. Represent at least one-third of the total credit hours for the program but no more than two-thirds of the total credit hours for the program.</p> <p>b. Include a technical core preparing students for increasingly complex technical specialties experienced later in the curriculum.</p> <p>c. Develop student competency in the discipline. Program Criteria may add specificity to student competencies.</p> <p>d. Include design considerations appropriate to the discipline and degree level such as: industry and engineering standards and codes; public safety and health; and local and global impact of engineering solutions on individuals, organizations, and society;</p> <p>e. Include topics related to professional and ethical responsibilities, respect for diversity; and quality and continuous improvement.</p>
<p><u>Physical and Natural Science</u> The basic science content of the program must include physical or natural science with laboratory experiences as appropriate to the discipline.</p>	<p><u>Physical and Natural Science</u> The basic science content of the program must include physical or natural science with laboratory experiences as appropriate to the discipline.</p>
<p><u>The Integration of Content</u> Baccalaureate degree programs must provide a capstone or integrating experience that develops student competencies in applying both technical and non-technical skills in solving problems.</p>	<p><u>The Integration of Content</u> Baccalaureate degree programs must provide a capstone or integrating experience that develops student competencies in applying both technical and non-technical skills in solving problems.</p>

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<p><u>Cooperative Education</u> When used to satisfy prescribed elements of these criteria, credits based upon cooperative/internships or similar experiences must include an appropriate academic component evaluated by the program faculty.</p>	<p><u>Cooperative Education</u> When used to satisfy prescribed elements of these criteria, credits based upon cooperative/internships or similar experiences must include an appropriate academic component evaluated by the program faculty.</p>
<p><u>Advisory Committee</u> An advisory committee with representation from organizations being served by the program graduates must be utilized to periodically review the program's curriculum and advise the program on the establishment, review, and revision of its program educational objectives. The advisory committee must provide advisement on current and future aspects of the technical fields for which the graduates are being prepared.</p>	<p><u>Advisory Committee</u> An advisory committee with representation from organizations being served by the program graduates must periodically review the program's educational objectives and curriculum. The advisory committee must provide advisement on current and future aspects of the technical fields for which the graduates are being prepared.</p>
Criterion 6. Faculty	Criterion 6. Faculty – Proposed
<p>Each faculty member teaching in the program must have expertise and educational background consistent with the contributions to the program expected from the faculty member. The competence of faculty members must be demonstrated by such factors as education, professional credentials and certifications, professional experience, ongoing professional development, contributions to the discipline, teaching effectiveness, and communication skills. Collectively, the faculty must have the breadth and depth to cover all curricular areas of the program.</p>	<p>Each faculty member teaching in the program must have expertise and educational background consistent with the contributions to the program expected from the faculty member. The competence of faculty members must be demonstrated by such factors as education, professional credentials and certifications, professional experience, ongoing professional development, contributions to the discipline, teaching effectiveness, and communication skills. Collectively, the faculty must have the breadth and depth to cover all curricular areas of the program. Program Criteria may add specificity to faculty requirements.</p>
<p>The faculty serving in the program must be of sufficient number to maintain continuity, stability, oversight, student interaction, and advising. The faculty must have sufficient responsibility and authority to improve the program through definition and revision of program educational objectives and student outcomes as well as through the implementation of a program of study that fosters the attainment of student outcomes.</p>	<p>The faculty serving the program must be of sufficient number to maintain continuity, stability, oversight, student interaction, and advising. The faculty must have sufficient responsibility and authority to improve the program through definition and revision of program educational objectives and student outcomes and through implementation of a program of study fostering attainment of student outcomes.</p>

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<i>Program Criteria (Preamble)</i>	<i>Program Criteria (Preamble) – Proposed</i>
<p>Each program seeking accreditation from the Engineering Technology Accreditation Commission of ABET must demonstrate that it satisfies all Program Criteria implied by the program title.</p>	<p>Each program seeking accreditation from the Engineering Technology Accreditation Commission of ABET must satisfy all applicable Program Criteria. Applicability is determined by the official degree title.* Program Criteria provide specific requirements needed for interpretation of the general criteria for a given discipline. Requirements stipulated in the Program Criteria are to be limited to curriculum and faculty. If a program, by virtue of its degree title, becomes subject to two or more sets of Program Criteria, that program must satisfy each set of Program Criteria. However, overlapping requirements need be satisfied only once.</p>