MEMORANDUM FOR: ABET Professional Societies

SUBJECT: Guidance for the Formatting Change to ETAC Program Criteria

On January 14, 2017, the Executive Committee (ExCom) of the Engineering Technology Accreditation Commission (ETAC) approved a change to the format of program criteria to include only "Curriculum" and "Faculty" content. The primary reason for making this change is that programs, evaluators, and team chairs disagreed widely how to evaluate compliance with ETAC program criteria that include "outcomes." In addition, the new template aligns Program Criteria more closely with proposed changes in General Criteria 3 &5.

The new program criteria template is the result of lengthy discussions with members of ExCom, ABET staff, practitioners, members of the ABET Academic Advisory Council, and members of the leadership of the Engineering Technology Council of ASEE. The conclusion was that the most effective and efficient way to handle program criteria in the future is to have societies define curricular elements needed to differentiate the discipline. Because the Engineering Accreditation Commission (EAC) has handled program criteria in this fashion for several years, societies are already aware of and familiar with this methodology. The Applied Science Accreditation Commission (ASAC) now uses the same format. [Note: CAC has a special situation and handles program criteria differently.] An example of program criteria (not approved by IEEE) has been added to the end of this document to demonstrate how current program criteria could be adapted to the new format.

Justification and guidance for the two sections follows:

1. Background
    a. Historical perspective: Outcomes-based education (and its assessment) begins with the institution's *mission* and goals or objectives. Intervening administrative units and the program may also have mission statements. Programs develop *program educational objectives* (PEOs) that, if achieved by graduates, will lead to mission accomplishment. After PEOs are created, *student outcomes* are selected that enable program graduates to achieve the PEOs. Finally, a *curriculum* is developed to provide the means by which students attain student outcomes.
    b. Definition of Student Outcomes: The ETAC criteria document includes the following definition: "Student outcomes describe what students are expected to know and be able to do by the time of graduation. These relate to the skills, knowledge, and behaviors that students attain as they progress through the program." That is to say, "they progress through the *curriculum*."
    c. Criterion 3. Student Outcomes: Criterion 3A (Associate) and 3B (Baccalaureate) require, among others, that student outcomes include the ability to apply the knowledge, techniques, skills, and modern tools ***of the discipline*** (emphasis added); the ability to apply knowledge of engineering and technology; and the ability to analyze and solve engineering technology problems. Each of these items is related to the discipline. Proposed changes in Criterion 3 anticipate that these requirements for student outcomes will remain.

2. Curriculum
    a. Definition of curriculum: There is no single agreed-upon definition of curriculum, although many are similar. One that uses words consistent with ABET terminology is:

        > **Curriculum** refers to the means and materials with which students will interact for the purpose of achieving identified educational outcomes.
        > *By Edward S. Ebert II, Christine Ebert, Michael L. Bentley*
        > *Updated on Jul 19, 2013*
        > www.education.com/reference/article/curriculum-definition/

    b. Criterion 5, Curriculum: Criterion 5 requires curricula to include technical content that develops competency in the use of equipment and tools ***common to the discipline*** (emphasis added).
    c. Program Criteria: The ETAC Criteria state that "The Program Criteria provide discipline-specific accreditation criteria. Programs must show that they satisfy all of the specific Program Criteria implied by the program title."
    d. Relationship of Program Criteria to Student Outcomes through Curriculum: Societies use the "Curriculum" section of program criteria to differentiate the discipline by specifying curricular elements[1] that relate to the knowledge and skills required of the discipline indicated by the title of the program criteria. As programs develop their required student outcomes; these are the skills and knowledge ***of the discipline*** required by Criterion 3.
    e. Societies adapting current Program Criteria to the new format will find that many items currently listed under the "Outcomes" section can be rewritten to conform to the new template under "Curriculum."
3. Faculty
    a. This section is not intended to generate long lists of faculty requirements that would be difficult for a program to meet.
    b. The following is an example taken from the ASAC Environmental Health and Safety Program Criteria: "The majority of core faculty should hold certifications issued by nationally accredited credentialing bodies such as Certified Industrial Hygienist or Certified Safety Professional."
    c. As indicated in the template, there is no requirement for societies to include this section if no requirements are needed beyond Criterion 6. Faculty.

For the Engineering Technology Accreditation Commission Criteria Committee

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[1] Societies should not specify "courses." Programs are free to cover the required content in the curriculum in particular courses or across the curriculum.

PROGRAM CRITERIA FOR ELECTRICAL/ELECTRONIC(S) ENGINEERING TECHNOLOGY AND SIMILARLY NAMED PROGRAMS

Lead Society: Institute of Electrical and Electronics Engineers

These program criteria apply to engineering technology programs that include electrical or electronic(s) or similar modifiers in their titles.

I. PROGRAM CRITERIA FOR ASSOCIATE LEVEL PROGRAMS

Curriculum

The curriculum must prepare associate degree graduates with skills necessary to enter careers in the design, application, installation, manufacturing, operation and/or maintenance of electrical/electronic(s) systems. Graduates of associate degree programs typically have strengths in the building, testing, operation, and maintenance of existing electrical systems. The curriculum must prepare graduates to have competencies and hands-on knowledge in the following curricular areas:

a. the application of circuit analysis and design, computer programming, associated software, analog and digital electronics, and microcomputers, and engineering standards to the building, testing, operation, and maintenance of electrical/electronic(s) systems; and
b. the application of natural sciences and mathematics at or above the level of algebra and trigonometry to the building, testing, operation, and maintenance of electrical/electronic systems.

II. PROGRAM CRITERIA FOR BACCALAUREATE LEVEL PROGRAMS

Curriculum

The curriculum must prepare baccalaureate degree graduates with skills necessary to enter careers in the design, application, installation, manufacturing, operation and/or maintenance of electrical/electronic(s) systems. Graduates of baccalaureate degree programs are well prepared for development and implementation of electrical/electronic(s) systems. Given the breadth of technical expertise involved with electrical systems, and the unique objectives of individual programs, some baccalaureate programs may focus on preparing graduates with in-depth but narrow expertise, while other programs may choose to prepare graduates with expertise in a broad spectrum of the field. Therefore, the depth and breadth of expertise demonstrated by baccalaureate graduates must be appropriate to support the educational objectives of the program. The curriculum must prepare graduates to have competencies in the following curricular areas:

a. the application of circuit analysis and design, computer programming, associated software, analog and digital electronics, and microcomputers, and engineering standards to the building, testing, operation, and maintenance of electrical/electronic(s) systems;
b. the application of natural sciences and mathematics at or above the level of algebra and trigonometry to the building, testing, operation, and maintenance of electrical/electronic systems;
c. the ability to analyze, design, and implement one or more of the following: control systems, instrumentation systems, communications systems, computer systems, or power systems;
d. the ability to apply project management techniques to electrical/electronic(s) systems; and
e. the ability to utilize differential and integral calculus, as a minimum, to characterize the performance of electrical/electronic systems.