An Examination of the Proposed Changes to ABET-EAC-Criteria

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Abstract

A proposal has been under consideration for several years to make major changes to requirements of ABET-Engineering Accreditation Commission's (EAC) Criterion 3-Student Outcomes and Criterion 5-Curriculum. The proposed changes were posted on ABET website for public review and comments with a deadline of June 30, 2016. The proposed changes were discussed and voted upon during the ABET summer commission meeting in 2016. The EAC commission approved the proposed changes with minor modification. The proposed changes were forwarded to the Engineering Area Delegation, which has the final approval authority for any changes to the criteria. The EAC recommended that the Engineering Area Delegation consider another year of public review and comment to ensure that all constituents have had ample opportunity to consider the latest modifications to the proposed changes, and provide additional comments. The Engineering Area Delegation had the option of considering the following three options: i) approve the proposed criteria as written and implement, ii) delay final approval for one year and seek additional public comments, as recommended by the commission, or iii) reject the proposal. At the end of October, the Engineering Area Delegation decided to place the most recent version of the proposed changes for public review and seek additional comments. It is anticipated that the proposed changes be approved in 2017 with possible date of implementation in 2019-2020 ABET evaluation cycle. This paper reviews the history of changes to ABET-EAC's general criteria and highlights the proposed changes in criteria 3 and 5. It also briefly explains how the proposed changes might affect the assessment process of student outcomes in the engineering programs.

Introduction

The ABET-Engineering Commission (EAC) accreditation of engineering programs based on students' learning outcome assessment (EC-2000) began in late 1990s. During the last few years of 1990s programs were given the choice of being evaluated based on the old criteria or the newly established EC-2000 criteria. Since 2000, all engineering programs requesting accreditation for the first time or seeking re-accreditation by ABET-EAC have been required to demonstrate that program meets a set of criteria that include both the general criteria for baccalaureate degree programs and the program criteria required by the program lead society (e.g., ASCE, IEEE, ASME).[1] The programs must also meet all the requirements listed in the Accreditation-Policy-and-Procedure-Manual (APPM) of ABET.[2] This paper is an improved version of a paper presented at ASEE-Gulf Southwest Section in March 2016.[3]

Summary of Changes Since 2000

Since 2000, there has been minor changes to EAC's general criteria and program criteria. Originally the ABET-EAC-2000 accreditation was based on 7 general criteria components and an additional program criteria. The general criteria consisted of (1) Students, (2) Program Educational Objectives (PEO), (3) Program Outcome and Assessment, (4) Professional Components, (5) Faculty, (6) Facilities, and (7) Institutional Support and Financial Resources. For a number of years the attainment of program educational objectives (PEO) and the program outcomes (PO) were parts of the requirements of Criterion 2 and Criterion 3, respectively. For the 2008-09 evaluation

cycle, some changes were made to the general EAC requirements. The requirements for evaluation of PEOs and POs were removed from criteria 2 and 3 and became a part of requirements for an added criterion, Criterion 4-Contineous Improvement. The title of Program Outcomes and Professional Components were changed to Student Outcomes (SO) and Curriculum, respectively.

Since the 2008-09 accreditation cycle, the EAC general criteria included the following eight (8) components: (1) Students, (2) Program Educational Objectives (PEO), (3) Student Outcomes (SO) (4) Continuous Improvement, (5) Curriculum, (6) Faculty, (7) Facilities, and (8) Institutional Support.[4]

During the 2012-13 evaluation cycle, ABET-EAC, the requirement of evaluation of PEOs was removed from Criterion 4-Continuous Improvement. The main reason for this change was that most institutions had a difficult time to satisfy this requirement. Program educational objectives are broad statements that describe what graduates are expected to attain within a few years of graduation. Institutions are not in control of graduates after they leave school and in most cases they lose contact with graduates. Therefore, it was quite difficult to collect data to demonstrate whether graduates are attaining the stated PEOs. Table 1 shows the changes in the statements and requirements for Criterion 4-Continuous Improvement from 2012-13 to2013-14 evaluation cycles. Since 2012-13 accreditation cycle, programs have not been required to demonstrate the attainment of PEOs.

Table 1. Change in the requirements of Criterion 4, from 2012-13 to 2013-14 evaluation cycles.

Criterion 4- Continuous Improvements	
2012-13 Evaluation Cycle	**2013-14 Evaluation Cycle**
The program must regularly use appropriate, documented processes for assessing and evaluating the extent to which *both the program educational objectives and the student outcomes are being attained*. The results of these evaluations must be systematically utilized as input for the continuous improvement.	The program must regularly use appropriate, documented processes for assessing and evaluating the extent to which *the student outcomes are being attained*. The results of these evaluations must be systematically utilized as input for the continuous improvement of the program. *Other available information may also be used to assist in the continuous improvement of the program*.

In addition to changes to EAC general criteria, the lead technical societies for the specific programs have made changes to the program criteria. For example ASME is the lead society for the Mechanical Engineering (ME) programs. Table 2 shows changes to the curriculum requirement of ME Program Criteria.

Table 2 shows that until the 2008-09 accreditation cycle, engineering programs were required to demonstrate that graduates have the ability to apply principles of engineering, basic science, and mathematics (including multivariate calculus and differential equations); to model, analyze, design, and realize physical systems, components or processes; and work professionally in both

thermal and mechanical systems areas. Therefore this was an outcome based requirement, needing an assessment of student ability. Since 2012-13 accreditation cycle, programs are no longer required to demonstrate that the graduate have the ability of meeting the requirements of the curriculum topics, but the programs must require the students to apply the requirement of the stated topics. Therefore, no more outcome assessment is necessary for the curriculum requirements of the ME Program Criteria. In the 2012-13 accreditation cycle programs had to prepare students to work professionally in both thermal and mechanical systems areas. This required students to complete design projects both in thermal and mechanical systems areas. This requirement was changed in 2013-14 accreditation cycle and the programs are now required to prepare students to work professionally in either thermal or mechanical systems while requiring topics in each area. Therefore the design projects are only needed in one area, but students must still be exposed to topics in both areas.

Table 2. Changes in Curriculum requirements of ME Program Criteria

Changes in Curriculum requirements of ME Program Criteria		
2008-09 Accreditation Cycle	**2012-13 Accreditation Cycle**	**2013-14 Accreditation Cycle**
The program must demonstrate that graduates have the ability to apply principles of engineering, basic science, and mathematics (including multivariate calculus and differential equations) to model, analyze, design, and realize physical systems, components or processes; *and work professionally in both thermal and mechanical systems areas.*	*The curriculum must require students to apply* principles of engineering, basic science, and mathematics (including multivariate calculus and differential equations); to model, analyze, design, and realize physical systems, components or processes; *and prepare students to work professionally in both thermal and mechanical systems areas.*	The curriculum must require students to apply principles of engineering, basic science, and mathematics (including multivariate calculus and differential equations); to model, analyze, design, and realize physical systems, components or processes; *and prepare students to work professionally in either thermal or mechanical systems while requiring topics in each area.*

Proposed Changes to Criterion 3 and Criterion 5

In late 2000s ABET started to harmonize the criteria among the four ABET commissions which includes Applied Science Accreditation Commission (ASAC), Computing Accreditation Commission (CAC), Engineering Accreditation Commission (EAC), and Engineering Technology Accreditation Commission (ETAC). The commissions agreed on harmonization of five (5) criteria that included Criterion 1-Students, Criterion 2-Program Educational Objectives, Criterion 4-Continous Improvement, Criterion 7-Facilities, and Criterion 8-Institutional Support. This means that the requirements for these criteria are the same among all four commissions and any changes to these five criteria requires approval from all four commissions. Criterion 3-Student Outcomes, Criterion 5-Curriculum, and Criterion-6 Faculty are not harmonized; meaning that the requirements for these three criteria are not the same for all four commissions, and each commission has the freedom of making changes to these three criteria on their own.

In 2009, when the Criteria Committee of EAC was completing the process of harmonizing the criteria across ABET's four commissions, EAC appointed a task force to start the review of Criterion 3. Main motivation for revising criterion 3 was that very few changes had been made to student outcomes (a-k) since 2000. There was a question whether the list of Student Outcomes still meet the original intent. Also most citations of shortcomings during the accreditation of programs were related to the assessment of student outcomes.

The taskforce for the revision of criterion 3 was assigned to develop a process that included:

- the identification of stakeholders and outreach to these groups,
- the examination of the number of shortcomings associated with Criterion 3,
- the review of correspondence received by ABET concerning Criterion 3,
- in-depth literature review of desired attributes for engineers, and
- development of several cycles of draft proposals for review by a broad range of constituents and request feedback from them.

Based on the original feedback from the constituents, the task force identified 75 potential attributes to be added to student outcomes. The potential attributes were grouped into five (5) categories identified as: technical, business, communication, professionalism, and individual skills. During this process it was realized that student outcomes should be tied to Criterion 5-Curriculum, hence requiring revision of that criterion also. The EAC Criterion Committee prepared a draft version of revised Criterion 3 and Criterion 5. The Criterion Committee presented a draft version to EAC during the July 2014 summer commissions meeting. The EAC members suggested some changes to the draft versions and recommended that the committee seek additional comments from the deans, faculty members of engineering programs, and industry. Between July 2014 and May 2015, ABET solicited input from engineering societies, deans, faculty, and industry. Based on the input received, the EAC Criteria Committee made changes to the 2014 draft version of criteria 3 and 5. The updated proposed Criterion 3 and Criterion 5 were presented to EAC again in July 2015 commissions meeting for approval. After a long discussion, it was decided to table the proposal and place it for public viewing for an additional period of time. The proposed changes were posted on ABET website for public review and comments with a deadline of June 30, 2016. During the additional period the engineering educational communities paid close attention to the proposed changes to criteria 3 and 5 and provided many valuable comments for improving the proposed changes. For example during the 2016 ASEE National conference in New Orleans, a town hall meeting was held to discuss the proposed changes to ABET criteria 3 and 5. An ASEE feedback committee had earlier compiled member input and had posted those comments on the ASEE website.[5, 6] After a brief panel presentation by ASEE feedback committee, breakout sessions were formed to discuss the specific areas of interest related to the proposed changes to ABET criteria 3 and 5. Based on the results of the discussion at the town hall meeting, the ASEE feedback committee created a document called "Summary of ASEE Member Views on Proposed Changes to ABET Engineering Accreditation Standards." The document was submitted to ABET-EAC Criteria Committee for consideration.

During 2015-16 public review, the EAC-Criteria Committee received approximately 250 input from the public. Based on the input received, the committee revised the proposed new Criterion 3 and Criterion 5 and presented them to EAC commissioners during the July 2016 (July 13-16) meeting of the EAC Commission. After some discussions, few additional changes were made to the proposal. The EAC commission then voted and approved the proposed new Criterion 3 and Criterion 5 called the "first reading" for these criteria. However, EAC members recommended that the first reading be placed for public review for one additional year.

2016 First Reading Proposal

The first reading of the proposed Criterion 3 and Criterion 5 was submitted to ABET Engineering Area Delegation, which has the final approval authority for the approval of proposed changes. The EAC had recommended that the delegation consider another year of public review and comment to ensure all constituents have ample opportunity to consider these latest modifications, and provide any additional comments. The Engineering Area Delegation had the following three options: i) approve the proposed criteria as written and implement, ii) delay final approval for one year and seek additional public comment, as recommended by the commission, or iii) reject the proposal. At the end of October, 2016, the Board of Area Delegates placed the first reading for public review and comments.[7] A side by side comparison of the criterion 3 and criterion 5 as submitted in 2015 and the proposed for the first reading in 2016 is posted on the ABET website.[8]

Even though the first reading proposal is not approved by Board of Area Delegates yet, it is anticipated that the changes to Criterion 3 and Criterion 5 be approved in near future with few possible modifications. The following sections highlight the changes to Criteria 3 and 5 and explain how these changes might affect the engineering programs. A similar study was conducted a year earlier which was based on the proposed changes submitted by EAC commission in 2015.[9] The following sections explains the proposal submitted as the first reading in 2016.

The first part of the 2016 first reading proposal deals with definitions. It states that "The Engineering Accreditation Commission of ABET recognizes that its constituents may consider certain terms to have certain meanings; however, it is necessary for the Engineering Accreditation Commission to have consistent terminology. Thus, the Engineering Accreditation Commission will use the following definitions in applying the criteria.[8]

No definition was provided in the Original EC-2000 Criteria. ABET-EAC gradually started to add definitions to ABET-EAC's general criteria for accreditation. During the 2004-05 accreditation cycle the following two definitions were added:

- **Program Educational Objectives** Although institutions may use different terminology, for purposes of Criterion 2, program educational objectives are intended to be statements that describe the expected accomplishments of graduates during the first several years following graduation from the program.

- **Student Outcomes** – Although institutions may use different terminology, for purposes of Criterion 3, program outcomes are intended to be statements that describe what students are expected to know or be able to do by the time of graduation from the program.

The current four definitions, established during the 2008-09 accreditation cycle, are listed below.

- **Program Educational Objectives** – Program educational objectives are broad statements that describe what graduates are expected to attain within a few years of graduation. Program educational objectives are based on the needs of the program's constituencies.

- **Student Outcomes** – 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 acquire as they progress through the program.

- **Assessment** – Assessment is one or more processes that identify, collect, and prepare data to evaluate the attainment of student outcomes. Effective assessment uses relevant direct, indirect, quantitative and qualitative measures as appropriate to the outcome being measured. Appropriate sampling methods may be used as part of an assessment process.

- **Evaluation** – Evaluation is one or more processes for interpreting the data and evidence accumulated through assessment processes. Evaluation determines the extent to which student outcomes are being attained. Evaluation results in decisions and actions regarding program improvement.

Tables 3 through 7 compare the terminology used in the current Criterion 5 and those included in the 2016 first reading of Criterion 5. These tables show that either new definitions are added or the statements for the existing definitions are expanded to remove ambiguity or misunderstanding by the engineering programs. For example, a definition is added for the college-level mathematics and examples are included as types of acceptable courses or topics. Table 6 shows that in the 2016 first reading, the definition of engineering design is expanded and examples provided to clarify the misunderstandings by some engineering programs.

Table. 3 Comparison of definition for Basic Science

Basic Science	
Current definition	**2016 first reading proposal**
Basic sciences are defined as biological, chemical, and physical sciences.	Basic sciences are *disciplines* focused on knowledge or understanding of the fundamental aspects of natural phenomena. Basic sciences consist of chemistry and physics and other natural sciences including life, earth, and space sciences.

In the 2016 first reading proposal there are only seven outcomes associated eith Criterion 3-Student Outcomes as compared to the 11 outcomes (a-k) in the current Criterion 3. Some of the current student outcomes are moved into the requirements of the Criterion 5 of the 2016 first reading proposal. Table 8 compares the lead statement of the current Criterion 3 with that of 2016 first reading proposal.

Table 4. Comparison of definition for College Level Mathematics

College-Level Mathematics	
Current definition	**2016 first reading proposal**
No definition, but it is understood that it must be above pre-calculus	College-level mathematics consists of mathematics that requires a degree of mathematical sophistication at least equivalent to that of introductory calculus. For illustrative purposes, some examples of college-level mathematics include calculus, differential equations, probability, statistics, linear algebra, and discrete mathematics

Table 5. Comparison of definition for Engineering Science

Engineering Science	
Current definition	**2016 first reading proposal**
The engineering sciences have their roots in mathematics and basic sciences but carry knowledge further toward creative application. These studies provide a bridge between mathematics and basic sciences on the one hand and engineering practice on the other.	Engineering sciences are based on mathematics and basic sciences but carry knowledge further toward creative application needed to solve engineering problems. These studies provide a bridge between mathematics and basic sciences on the one hand and engineering practice on the other

Table 6. Comparison of definition for Engineering Design

Engineering Design	
Current definition	**2016 first reading proposal**
Engineering design is the process of devising a system, component, or process to meet desired needs. It is a decision-making process (often iterative), in which the basic sciences, mathematics, and the engineering sciences are applied to convert resources optimally to meet these stated needs.	Engineering design is the process of devising a system, component, or process to meet desired needs and specifications within constraints. It is an iterative, creative, decision-making process in which the basic sciences, mathematics, and engineering sciences are applied to convert resources into solutions. The process involves identifying opportunities, performing analysis and synthesis, generating multiple solutions, evaluating those solutions against requirements, considering risks, and making trade-offs to identify a high quality solution under the given circumstances. For illustrative purposes only, examples of possible constraints include accessibility, aesthetics, constructability, cost, ergonomics, functionality, interoperability, legal considerations, maintainability, manufacturability, policy, regulations, schedule, sustainability, or usability.

Table 7. Comparison of definition for Team

Team	
Current definition	**2016 first reading proposal**
No definition	A team consists of more than one person working toward a common goal and should include individuals of diverse backgrounds, skills, or perspectives consistent with ABET's policies and positions on diversity and inclusion

Table 8. Comparison of the opening statements for criterion 3

Current statement	**2016 first reading proposal**
The program must have documented student outcomes that prepare graduates to attain the program educational objectives. Student outcomes are outcomes (a) through (k) plus any additional outcomes that may be articulated by the program.	The program must have documented student outcomes that support the program educational objectives. Attainment of these outcomes prepares graduates to enter the professional practice of engineering. Student outcomes are outcomes (1) through (7), plus any additional outcomes that may be articulated by the program.

Tables 9 shows the equivalencies of current student outcomes (a) through (k) with the seven student outcomes included in the 2016 first reading proposal for Criterion 3. Note that the current student outcomes (a) and (e) are combined into a single student outcome (1) in the 2016 first reading proposal. The statement for the student outcome (c) is very similar to student outcome (2), except that the "manufacturability, and sustainability" requirements of the current outcome now is included as requirements for Criterion 5-Curriculum, in the 2016 first draft proposal. Student outcome (b) in the current criterion 3 is equivalent to student outcome (3) in the 2016 proposal, except that the wording in the statement has been changed to remove some of the confusions. The ability to design of experiment interpreted differently by various programs. A search on the Internet for "design of experiment" results in several different definitions. The proposed change of wording to "an ability to develop appropriate experimentation," makes it more clear that student not only have to be able to conduct experiment following a given procedure, but they also have to be able to develop experimentation on their own for an specific purpose. Current statement for student outcome (g) is expanded and presented as student outcome (4) in the 2016 proposal. The current student outcomes (f) and (h) are combined and are presented as student outcom5 in the 2016 proposal. Student outcome (i) is reworded and is presented as student outcome (6) in the 2016 proposal. Student outcome (d) is reworded and is presented as student outcome (7) in the 2016 proposal. Student outcome (j) is not included in the 2016 proposal and student outcome (k) is a requirement of part (b) of criterion 5 in the 2016 proposal.

Table 9. Equivalencies of student outcome in the current and 2016 first draft proposal for criterion 3

Current Student Outcomes	2016 first reading proposal
SO (a) an ability to apply knowledge of mathematics, science, and engineering SO (e) an ability to identify, formulate, and solve engineering problems	SO-1 an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
SO (c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	SO-2 an ability to apply the engineering design process to produce solutions that meet specified needs with consideration for public health and safety, and global, cultural, social, environmental, economic, and other factors as appropriate to the discipline
SO (b) an ability to design and conduct experiments, as well as to analyze and interpret data	SO-3 an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
SO (g) an ability to communicate effectively	SO-4 an ability to communicate effectively with a range of audiences
SO (f) an understanding of professional and ethical responsibility SO (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	SO-5 an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
SO (i) a recognition of the need for, and an ability to engage in life-long learning	SO-6 an ability to recognize the ongoing need to acquire new knowledge, to choose appropriate learning strategies, and to apply this knowledge.
SO (d) an ability to function on multidisciplinary teams	SO-7 an ability to function effectively as a member or leader of a team that establishes goals, plans tasks, meets deadlines, and creates a collaborative and inclusive environment.
SO (j) a knowledge of contemporary issues	Not included
SO (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice	Part of Criterion 5-(b)

Table 10 compares the requirements of the current criterion 5 with those included in the 2016 first draft proposal. In the current requirements one year is defined as 32 semester credit hours for programs requiring 128 semester credit hours or more for the degree or 25% of total semester

hours required for the degree if it is less than 128 hours. In the 2016 first draft proposal one year is defined as 30 hours regardless of the total hours required for the degree. It should be noted that

Table 10. Comparison of the current requirements of criterion 5 with those for the 2016 proposal

Current criterion 5 requirements	2016 first reading proposal
a. one year of a combination of college level mathematics and basic sciences (some with experimental experience) appropriate to the discipline	a. a minimum of 30 semester credit hours (or equivalent) of a combination of college-level mathematics and basic sciences with experimental experience appropriate to the program
b. one and one-half years of engineering topics, consisting of engineering sciences and engineering design appropriate to the student's field of study	b. a minimum of 45 semester credit hours (or equivalent) of engineering topics appropriate to the program, consisting of engineering sciences and engineering design, and utilizing modern engineering tools (SO k)
c. a general education component that complements the technical content of the curriculum and is consistent with the program and institution objectives	c. a broad education component that complements the technical content of the curriculum and is consistent with the program educational objectives
d. a curriculum culminating in a major design experience based on the knowledge and skills acquired in earlier course work and incorporating appropriate engineering standards and multiple realistic constraints	d. a culminating major engineering design experience based on the knowledge and skills acquired in earlier course work that incorporates appropriate engineering standards and multiple constraints

Effects of 2016 First Reading Proposal on the Assessment Process

Discussions in the previous sections indicate that the majority of the current student outcomes (a) through (k) are configured into student outcomes (1) through (7) in the 2016 first reading proposal. Student outcome (j) is not a part of student outcomes in the 2016 first reading proposal. Outcome (k) has become a part of the Criterion 5-Curriculum requirements. Therefore an outcome assessment is not required. This suggest that number of student outcome assessments is reduced in the 2016 first reading proposal.

One important part of the first reading of the proposed criteria 3 and 5 is the added and expanded definitions. "Overall, most definitions are now longer, which underscores the many inputs from broad and diverse constituents."[5] The definition of "Basic Science" is expanded to clarify that it include chemistry, physics, and natural sciences (life, earth, space). "Mathematics" is defined more clearly in the proposal and a list of specific courses such as calculus, differential equations, probability, statistics, linear algebra, and discrete mathematics are given as examples. The definition of "Engineering Design" is vastly expanded that broadens the definition of the design process to include synthesis and analysis under a broad set of illustrative constraints such as aesthetics, constructability, manufacturability, and sustainability. "Team" is now defined as a

group of student that "consists of more than one person working toward a common goal and should include individuals of diverse backgrounds, skills, or perspectives consistent with ABET's policies and positions on diversity and inclusion." Currently Criterion 5-Curriculum requires a combination of one year of college level mathematics and basic sciences. It also requires one and half years of engineering sciences and engineering design. However, one year of academic year is not defined in the current Criterion 5. But in the self-study template, one academic year is defined as 32 semester credit hours (SCH) or 25% of the total credit hours required for the degree. In the proposed Criterion 5, the requirements are listed as a minimum of 30 SCH (or equivalent) of combination of college level mathematics and basic sciences as well as a minimum of 45 SCH (or equivalent) of engineering topics, consisting of engineering sciences and engineering design. The addition and expansion of these definitions helps to make the proposed 2016 criteria 3 and 5 more clear. However, the evaluation of some components of the proposed criteria is still subject to interpretation by the engineering programs and ABET program evaluators.

Engineering programs can still use their current instruments (or the modified version) for the assessment and evaluation of the seven student outcomes listed in the proposed Criterion 3. Most programs have been using the results of student performance on specific problems, laboratory experiments, design projects, or other types of reports as primary direct measurement for assessing student outcomes. Other instruments such as results of the fundamentals of engineering (FE) exam and student surveys have been used as secondary instruments for the assessment of student outcomes. Most programs have been using the same instruments for the assessment of both student outcomes (a) and (e). Since the proposed SO-1 is a combination of outcomes (a) and (e), programs can continue using the same instruments as before. For assessment of the proposed SO-2, programs can still use the same instruments as they were previously using for the current SO (c). For assessment of the proposed SO-3, again programs can still use the same instruments as they were previously using for the current SO (b). The proposed SO-4, an ability to communicate effectively with a range of audiences, replaces SO (g), an ability to communicate effectively. The phrase "with a range of audiences" can be subject to interpretation. It can be assumed that each program can define the range of audiences as groups of students, faculty, industrial advisory board members, etc. For assessments of SO-5 the same instruments can be previously utilized for the assessment of SO (f) and SO (h). Instruments previously used for the assessment of SO (i) can still be used for SO-6. The proposed SO-7 replaces SO (d). The word "multidisciplinary teams" in SO (d), an ability to function on multidisciplinary teams interpreted differently by different people. The questions was always asked if a multidisciplinary should be composed of students from various colleges, students from various engineering programs, or simply a diverse group of students from the same program. The proposed SO-7, "an ability to function effectively as a member or leader of a team that establishes goals, plans tasks, meets deadlines, and creates a collaborative and inclusive environment" requires a more complex assessment process. First the new definition of "Team" requires that a team should consist of more than one person working toward a common goal and should include individuals of diverse backgrounds, skills, or perspectives consistent with ABET's policies and positions on diversity and inclusion. Therefore, programs must demonstrate that the definition of Team is met. They must also demonstrate that each team has a leader, the team has established goals, plans tasks, and has met deadlines, and created a collaborative and inclusive environment.

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