

ABET proposes accreditation criteria revisions

More than 80 years ago, the Accreditation Board for Engineering Technology (ABET) was founded to ensure that new graduates had the skills needed to enter their profession. It began as the educational standard against which professional engineers in the United States were held for licensure. ABET accredits college and university programs in the disciplines of applied science, computing, engineering, and engineering technology at the associate, bachelor, and master degree levels.

ABET is structured as a federation of 35 professional and technical societies, including MRS, ACerS, NICE, and TMS, that relies on 2200 volunteers supported by 33 full-time and 10 part-time staff. It accredits an academic program leading to a specific degree in a specific discipline. Members of the engineering area delegation from the materials community include Todd Hufnagel (MRS), professor of materials science and engineering, Johns Hopkins University; William Mullins (ACerS/NICE), program officer, structural materials, US Office of Naval Research; Ashok Saxena (TMS), provost, University of Arkansas; and Kristen Constant (WEPAN), Wilkinson Professor of Interdisciplinary Engineering and Chair, Iowa State University.

The guiding principles of accreditation decisions are to ensure the quality of educational programs, to foster the systematic pursuit of quality improvement in educational programs, and to develop educational programs that satisfy the needs of constituents in a dynamic and competitive environment.

There are eight ABET accreditation criteria, and each program has program-specific criteria:

- (1) Students
- (2) Program Educational Objectives
- (3) Student Outcomes
- (4) Continuous Improvement
- (5) Curriculum
- (6) Faculty
- (7) Facilities
- (8) Support.

Since 2008, the Engineering Accreditation Commission (EAC) has had ongoing discussions regarding the potential need to revise Criterion 3: Student Outcomes. The committee recognized that this criterion had not been reviewed since it was originally formulated in the mid-1990s in preparation for outcomes-based criteria.

Over a period of several years, the EAC has been engaged in a process of review and improvement of Criterion 3, and has sought input from a broad variety of sources concerning skills and attributes needed for entry into the professional practice of engineering. The EAC used the input received and developed proposed revisions to the *Criteria for Accrediting Engineering Programs*. Revisions are to Criterion 3, framing student outcomes that address relevant topic areas, and moving some items into Criterion 5, Curriculum. Definitions and explanations currently in Criterion 5 were moved to a revised introductory section to the *Criteria for Accrediting Engineering Programs*.

At the request of the task force, the EAC also surveyed program evaluators during the 2010–2011 cycle regarding the elements of Criterion 3 that led to citations of shortcoming. The data collected revealed that programs had the most difficulty determining the extent of outcome attainment with the ability to

function on multidisciplinary teams, understanding of professional and ethical responsibility, a broad education to understand engineering solutions in global, economic, environmental, and societal context, recognition of the need for and ability to engage in lifelong learning, and knowledge of contemporary issues.

The EAC undertook an outreach effort in 2012–2013 to inform constituent groups that Criterion 3 was being reviewed and to solicit suggestions regarding changes. The proposed student outcomes (1–7) prepare graduates to enter the professional practice of engineering (see table).

The overarching intent of the proposed changes is to clarify outcomes that programs historically had difficulty assessing, to allow for more efficient assessment processes, to emphasize applications in an engineering context, and to add some elements of project management.

The Engineering Accreditation Commission welcomes input using the feedback survey link: www.abet.org/news/abet-releases-criteria-proposal-for-public-comment. This link will be active until **June 30, 2016**. Also, ABET senior staff and leadership will be presenting at several Society events, department head workshops, and other selected professional venues over the coming months. A symposium on Continuous Improvement of Academic Programs, including a panel discussion of the proposed revisions, will be held at the Materials Science & Technology meeting in Salt Lake City. For more information, visit www.abet.org. □

PROPOSED STUDENT OUTCOMES

- 1 An ability to identify, formulate, and solve engineering problems by applying principles of engineering, science, and mathematics.
- 2 An ability to apply both analysis and synthesis in the engineering design process, resulting in designs that meet desired needs.
- 3 An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
- 4 An ability to communicate effectively with a range of audiences.
- 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.
- 6 An ability to recognize the ongoing need for additional knowledge and locate, evaluate, integrate, and apply this knowledge appropriately.
- 7 An ability to function effectively on teams that establish goals, plan tasks, meet deadlines, and analyze risk and uncertainty.