

## An Overview of ABET Engineering Criteria 2000

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### A BRIEF HISTORY

The physical length of the document specifying the accreditation criteria for programs in engineering has increased yearly in recent memory. The general criteria now occupy over twelve full-sized double column pages in the ABET publication "Criteria for Accrediting Programs in Engineering in the United States." [1] The society generated program criteria require 15 additional pages. The detailed specifications have also grown increasingly complex. Recently, many engineering educators have seen this "criterion swell" as symptomatic of rules that have become too cumbersome, too prescriptive, and a recipe for the evolution of "cookie cutter" programs. In fact, some have charged that the current ABET general criteria constitute a negative incentive for sound educational experimentation and the evolution of better teaching methods. Although Criterion II.A.7 encourages well-planned experimentation, the engineering community has been reluctant to pursue such experimentation. Undoubtedly, the hesitation to pursue such experimentation may, in part, be traced to a fear of restrictive interpretations of the "old criteria."

In the early 90's, many outstanding institutions became openly frustrated with the prescriptive nature of the criteria. The relentless "bean-counting" often carried out on ABET visits increasingly became a focus for institutional irritation. With the advent of the TQM movement and with its emphasis on quality, a consensus that accrediting agencies should focus on outcomes instead of process began to form. Many regional accrediting agencies had already steered that course. There was a desire to achieve rigor without rigidity in the accreditation process; there was also a strong push to allow and encourage diversity in the missions and objectives of individual programs. The latter was underscored by the vociferous dissatisfaction of several research institutions, threatening to create their own accrediting body. This would have stratified engineering education by creating different classes of accreditation. Considering that prospect as well as a general recognition that it was time for a change, the EAC of ABET began to develop a new set of accreditation criteria - criteria which have since become known as Criteria 2000 (or C2000).

### CRITERIA 2000

The new criteria, C2000, are less prescriptive than were the "old criteria." The physical length of the general criteria is only slightly over two pages - a reduction in length of 11 pages. It is not yet clear how detailed the program criteria, imposed by the technical societies, will be; however,

constraints imposed by ABET would suggest that program criteria will be limited in scope to discipline-specific curricular requirements and hence relatively brief.

Each institution is responsible for meeting the eight criteria outlined in C2000. Institutions are also responsible for documenting that they satisfy each criterion. It is expected that the self-study documents will evolve from their present form to support this requirement. The following highlights the eight criteria [2].

(1) Students: The institution must monitor the quality and performance of students and graduates to demonstrate that it is successful in meeting its objectives.

(2) Program Educational Objectives: The institution must have published objectives for each program. These objectives must be consistent with the mission of the university. The institution must have in place a process that ensures that its objectives are continually reevaluated. The curriculum design and content must ensure the achievement of published objectives. There must be evidence that the institution uses continuing assessment to improve the program.

(3) Program Outcomes and Assessment: This criterion lists eleven areas in which students must acquire knowledge, skills (abilities), and understanding. The list is generally similar to expected outcomes defined in the current criteria. The criterion lists categories of evidence that may be used by the institution to verify the effectiveness of the program.

(4) Professional Component: Engineering programs must include one year of mathematics and science, one-and-a-half year of engineering topics, and a general education component that complements the technical content and is consistent with the mission of the institution.

(5) Faculty: The faculty must be sufficient in number and have the competencies to cover all curricular areas; the faculty size should also ensure adequate interaction with students. The faculty competence may be judged using a list of suggested attributes.

(6) Facilities: The facilities should support the program and include modern engineering tools, computing and information systems infrastructure.

(7) Institutional Support and Financial Resources: The institutional support and financial resources must assure the quality and continuity of the program.

(8) Program Criteria: each program must satisfy the applicable program criteria.

As was the case with the “old criteria,” C2000 is designed to ensure the development of the students’ professional competencies. Design and problem solving skills remain critical objectives. Other required subject matter includes mathematics and basic sciences; however, the general criteria do not prescribe specific mathematical topics, leaving such specifications in the program criteria. The criteria continue to stress communication skills, multidisciplinary teamwork, ethics, and an understanding of engineering practice in the context of society. Finally, the curriculum should lay the foundation for lifelong learning.

## CONCLUSION

The C2000 objectives do not differ from those of the "old criteria." However, C2000 is less prescriptive, leaving institutions with more freedom to innovate and continuously improve the process of engineering education.

ABET is implementing Criteria 2000 methodically and with great care. During the first year of trial visits, Criteria 2000 were used in visits to Worcester Polytechnic Institute and to the University of Arkansas. The experiences gathered in these visits are now being used to modify the campus visits and evaluate and perhaps revise the roles and contents of the self-study materials. During the coming (1997-98) accreditation season, four additional institutions will be reviewed against C2000. These include Harvey-Mudd, Georgia Institute of Technology, the University of North Dakota, and Union College.

As the EAC/ABET gains additional experience with C2000, the accreditation process, and particularly the self-study materials, will in all likelihood be revised. The integrity of the accreditation process under the new criteria will depend on the validity of the assessment measures in use, the quality of the evaluators' reports and last, but not least the soundness of the teams' judgments.

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[1] Criteria for Accrediting Programs in Engineering in The United States, Effective for Evaluations During the 1996-97 Accreditation Cycle, Engineering Accreditation Commission, Accrediting Board for Engineering and Technology, 111 Market Place, Suite 1050, Baltimore, MD 21202.

[2] ABET Engineering Criteria 2000, July 1996, Engineering Accreditation Commission, Accrediting Board for Engineering and Technology, 111 Market Place, Suite 1050, Baltimore, MD 21202.

### Biography

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