

# **View**points

# Issues of Accreditation in Higher Education Vol. IV

---

## Dual-Level Accreditation

### Foreword

The history of graduate-level accreditation in engineering education is as long as the history of ABET itself — some 75 years, to be exact. An examination of that history leaves little doubt as to the inherently complex and contentious nature of the issue. At present, as in the past, it appears neither proponent nor opponent can find common ground.

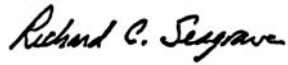
ABET, however, is neither of these, notwithstanding the fact that ABET is governed by a Board made up of representatives from 28 professional and technical societies. To the contrary, ABET is an instrument of the many constituencies it serves. And it is up to those constituencies to come to consensus on such issues as dual-level accreditation, make that consensus explicit, and then act through ABET their will.

This white paper, the fourth in the *Viewpoints* series, is no more than an attempt to inform ABET's constituencies of the dual-level issue and no less than a call to

By the Members  
of the Board Executive  
Committee of ABET, Inc.

those constituencies to build consensus for action. As it should always be with federations like ABET, our constituencies drive our mission and policies, not the other way around.

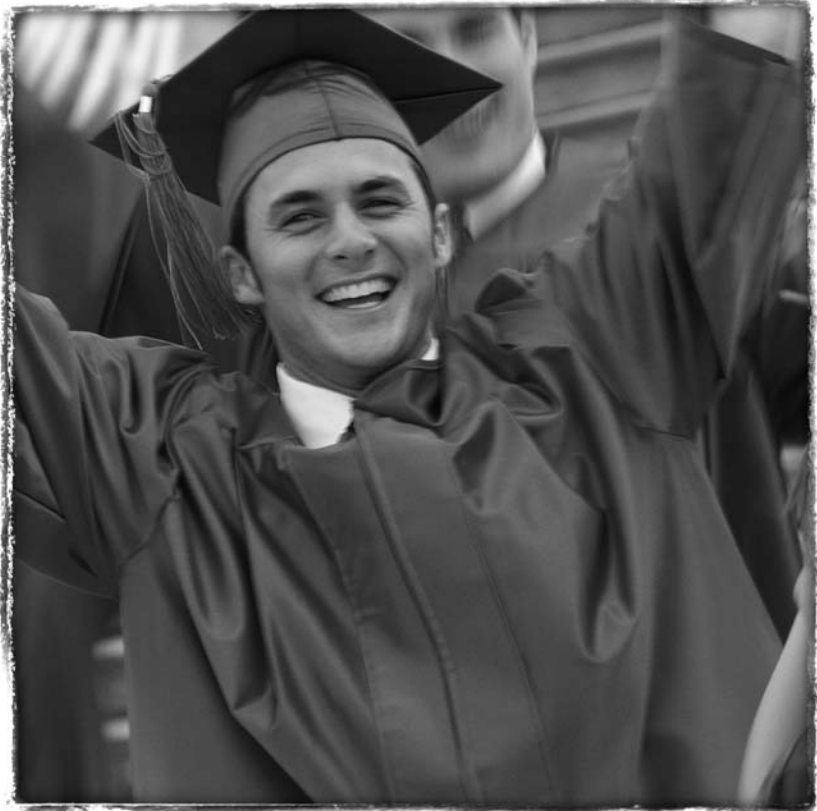
If you have feedback on this paper — and I sincerely hope you do — please send it to ABET headquarters using the contact information below. Your interest in and attention to this issue is appreciated.



Richard C. Seagrave  
ABET Past President

111 Market Place, Suite 1050  
Baltimore, MD 21202-4012  
[www.abet.org](http://www.abet.org)  
410-347-7700  
[info@abet.org](mailto:info@abet.org)

# Dual-Level Accreditation of Engineering Programs



## Introduction

In response to the report “Engineer of 2020” issued by the National Academy of Engineering and to initiatives from some of its constituent societies, the ABET Board of Directors Executive Committee sought comments from its constituencies with respect to the ABET/Engineering Accreditation Commission (EAC) long-standing policy II.B.8.a:

*Engineering programs may be accredited at either the baccalaureate or master’s level. A program may be accredited at only one level in a particular curriculum at a particular institution.*

During the six-month period from August 1, 2006, to January 31, 2007, ABET received responses from four of its member societies, from the President of the National Academy of Engineering, from the Engineering Deans’ Council of the American Society for Engineering Education (ASEE), and from fifteen concerned individuals: deans, program chairs, faculty members, and students.



## Background and History

It is apparent from an examination of history that ABET and its predecessor, the Engineers Council for Professional Development (ECPD), have struggled with this issue since 1932. It is also apparent that the fundamental arguments on both sides of the issue have not materially changed. This is a situation where an examination of history is useful and informative to the opponents and proponents of change.

When ECPD began accrediting engineering programs in 1932, there was a mixture of four-year and five-year programs leading to either bachelor's or master's degrees in engineering, with many prestigious institutions requiring five years. There was also some variation in degree length between engineering disciplines. Depending on the institution, either the bachelor's degree or the integrated master's degree could be regarded as the "first professional degree" for the four-year and five-year programs. ECPD consequently accredited whichever degree a particular institution offered as the first professional engineering degree. ECPD, from the outset, discussed the desirability and feasibility of also accrediting other advanced graduate degrees (master's and doctorates) in engineering and had a series of task groups working on that issue during the period leading up to World War II.

World War II and its aftermath produced a hiatus in the discussion of advanced graduate program accreditation. During the 1950s, reports show that ECPD was

clearly continuing on the track of accrediting the bachelor's level degree, at either four or five years, as the first professional degree and that interest in accrediting advanced graduate-level programs had almost completely diminished. This period was also marked by a decrease in the number of five-year programs. This was perceived to be a result of market forces between programs and institutions and the growing acceptance of and satisfaction in the four-year product by industrial employers and graduate schools.

In 1962, ECPD commissioned the American Society for Engineering Education (ASEE), one of ABET's founding societies, to conduct a study that would culminate in recommendations regarding the appropriate structure of engineering degrees. The final report, "Goals of Engineering Education," published in 1968, recommended the following:

1. The first professional degree in engineering should be the Master of Engineering degree, awarded on completion of an integrated program of at least five years. The first four years would concentrate on the common engineering core, with specialization occurring in the fourth year.
2. The credits required for a pre-engineering bachelor's degree should be reduced by 15%.
3. ECPD should gradually shift their accrediting activity away from the bachelor's degree to the master's degree.

A fourth recommendation, which drew significant negative comment from some societies (most notably AIChE and IEEE), was that accreditation of discipline-based degree programs be replaced by accreditation of the engineering unit as a whole. A number of ASEE leaders had been advocating that discipline-based undergraduate curricula be replaced by undesignated curricula, patterned after the "Engineering Science" model of the 1955 report "Evaluation of Engineering Education" (commonly known as the "Grinter Report"). Disciplinary specialization would then occur during the fifth-year master's program.

"Goals of Engineering Education" also recommended that accreditation be possible both for specialized and undesignated degrees (as was already the case), either by program or by engineering school, and either at the bachelor's or master's level or, if desired, both (dual-level accreditation). There were apparently very few cases of the latter.

ECPD continued to prohibit accreditation of the engineering unit as a whole, agreeing with the objection that programs of widely varying quality existed in some engineering schools. However, it did allow dual-level accreditation on a trial basis, beginning with the 1972-1973 accreditation cycle. Apparently, this encountered significant opposition, and the trial eventually ended in the late 1970s when the present prohibition was adopted. A parallel development in 1971 was the ECPD's adoption of criteria for advanced-level (master's degree) programs, which in the past had been subject to only the basic-level (bachelor's degree) criteria.

In 1988, with strong support from civil and environmental engineering societies, the ABET Board of Directors passed on first reading the removal of the dual-level prohibition. Opposition from engineering deans and others resulted in withdrawing the proposal before the second reading. As it had in the post-war period, the opposition centered again on market forces: competition for students and overall satisfaction with four-year degree graduates by employers.

ABET's creation of outcomes-based accreditation criteria (EC2000) in 1996 was in part stimulated by the desire to allow institutions and the engineering disciplines flexibility in defining their professional degree requirements, without regard to the "level" or "label" of the degree. The original version of the EC2000 General Criteria was intended to address accreditation of programs at either the basic or advanced, bachelor's or master's, level. The subsequent and perhaps unnecessary addition of a separate criterion for advanced-level programs has been a complicating factor in the present discussions.

Fast forward to 2004 and the National Academy of Engineering report "Engineer of 2020." This report repeats to a significant degree the recommendations of the 1968 ASEE report "Goals of Engineering Education," including the adoption of the master's-level degree as the first professional degree in engineering and the removal of the EAC/ABET prohibition on dual-level accreditation.



## Summary

Not surprisingly, the arguments for and against retaining the dual-level prohibition are very similar to those advanced in 1968 and again in 1989. Those supporting the prohibition make the following points:

1. Allowing both degree levels to be accredited would lead to added expense and time as programs and institutions would be pressured to seek accreditation at both levels, either by governing bodies or by resulting market pressures.
2. At a time when engineering enrollments are flattening or decreasing, the perceptions resulting from identifying the necessity of a fifth year would have a negative effect on maintaining or increasing the production of engineers in an environment where demand is already ahead of supply.
3. Employers appear to be very satisfied with the present four-year bachelor's graduates.
4. There is little evidence that the requirement of an additional year would materially increase the number of engineering graduates seeking registration as professional engineers.



Those supporting the removal of the prohibition argue:

1. The coursework material necessary to maintain the engineering core and to properly prepare graduates for the profession in some disciplines can no longer be accomplished in a four-year experience.
2. Institutions and programs that offer both bachelor's and master's degrees deserve the opportunity to have them both accredited.

Neither proponents nor opponents of retaining the dual-level prohibition address the significant disparity in views between engineering disciplines on what should constitute the first professional degree in engineering, nor do they address how dual-level accreditation in and of itself would affect this disparity. Without a compelling case one way or the other from either the traditional engineering disciplines or from interdisciplinary engineering programs and given what appears to be a growing shortage of engineering graduates at all levels, it is neither prudent nor appropriate for ABET to unilaterally change its policy at this time without a clear consensus from the engineering community. ABET Inc., a federation of 28 technical and professional societies that span a diverse spectrum of traditional and interdisciplinary disciplines, does not define the first professional degree for the disciplines. The policy of accrediting only the first professional degree for a given institution and discipline appears to be serving a very large segment of its constituencies satisfactorily, as it has since 1932.



## **Input Received from ABET's Constituencies**

### **Proponents of Removal of the Prohibition**

I. Formal positions taken by societies or organizations (available at [www.abet.org/dual.shtml](http://www.abet.org/dual.shtml))

1. National Academy of Engineering (NAE)
2. American Society of Civil Engineers (ASCE)
3. American Academy of Environmental Engineers (AAEE)
4. National Society of Professional Engineers (NSPE)

II. Communications from individuals

1. Paper by Smerdon, et al.
2. Seven submissions

Chuck Pennoni, Former ABET President

Ernest Smerdon, University of Arizona (available at [www.abet.org](http://www.abet.org))

Gerald Spencer, P.E.

Wallace Johnson, P.E.

Mickey Wilhelm, Dean of Engineering, University of Louisville

James Nelson, Dean of Engineering, The University of Texas at Tyler

Russel Jones, Former ABET President

### **Proponents of Retention of the Prohibition**

III. Formal positions taken by organizations

1. American Society for Engineering Education (ASEE) Engineering Deans' Council (available at [www.abet.org](http://www.abet.org))
2. IEEE Committee on Engineering Accreditation Activities

IV. Communications from individuals

1. Five submissions

Robert Dodds, Civil Engineering, University of Illinois

Lee Peterson, Aerospace Engineering, University of Colorado

Kirk Lindstrom, Questar Corporation

George Simmons, Dean of Engineering, Seattle University

Lyle Wilcox, Bell South (ret.)

## What Is ABET?

ABET, Inc., the recognized accreditor for college and university programs in applied science, computing, engineering, and technology, is a federation of 28 professional and technical societies representing these fields. Among the most respected accreditation organizations in the United States, ABET has provided leadership and quality assurance in higher education for 75 years. ABET currently accredits some 2,700 programs at over 550 colleges and universities nationwide. More than 1,500 dedicated volunteers participate annually in ABET activities. ABET also provides leadership internationally through workshops, consultancies, memoranda of understanding, and mutual recognition agreements, such as the Washington Accord. ABET is recognized by the Council for Higher Education Accreditation.

### 2007 Executive Committee

William S. Clark  
*ABET President*

Richard C. Seagrave  
*Past President*

L. S. "Skip" Fletcher  
*President-Elect*

Janet B. Perper  
*Secretary*

Daniel J. Bradley  
*Treasurer*

Larry A. Kaye  
James R. Plasker  
*Board Representatives  
to the Executive Committee*

### Ex-Officio

George D. Peterson  
*Executive Director*

David K. Holger  
*Accreditation Council Chair*

Michael S. Bisesi  
*Applied Science Accreditation  
Commission Chair*

Lawrence Jones  
*Computing Accreditation  
Commission Chair*

Gerald S. Jakubowski  
*Engineering Accreditation  
Commission Chair*

Phillip E. Borrowman  
*International Activities  
Council Chair*

Anthony L. Brizendine  
*Technology Accreditation  
Commission Chair*





## **ABET Member Societies**

American Academy of Environmental Engineers  
American Congress on Surveying and Mapping  
American Industrial Hygiene Association  
American Institute of Aeronautics and Astronautics, Inc.  
American Institute of Chemical Engineers  
American Nuclear Society  
American Society of Agricultural and Biological Engineers  
American Society of Civil Engineers  
American Society for Engineering Education  
American Society of Heating, Refrigerating,  
and Air-Conditioning Engineers, Inc.  
American Society of Safety Engineers  
ASME  
Biomedical Engineering Society  
CSAB, Inc.  
Health Physics Society  
IEEE, Inc.  
Institute of Industrial Engineers, Inc.  
ISA  
Materials Research Society  
National Council of Examiners for Engineering and Surveying  
National Institute of Ceramic Engineers  
National Society of Professional Engineers  
Society of Automotive Engineers  
Society of Manufacturing Engineers  
Society for Mining, Metallurgy, and Exploration, Inc.  
Society of Naval Architects and Marine Engineers  
Society of Petroleum Engineers  
The Minerals, Metals, and Materials Society



### **ABET, Inc.**

111 Market Place, Suite 1050  
Baltimore, MD 21202  
Phone: (410) 347-7700  
Fax: (410) 625-2238  
[www.abet.org](http://www.abet.org)

**Copyright© 2007 by ABET, Inc.®**

Printed in the United States of America. All rights reserved.