



Principles of Accreditation

2006 International Mechanical Engineering Conference

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College of Engineering
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My Background...accreditation

- ◆ ASME Program Evaluator 1987–1996
- ◆ ASME Representative, Engineering Accreditation Council (EAC) 1997-2003
- ◆ EAC Executive Committee 2002-2003
- ◆ International Team Chair/Evaluator 2003-Present
- ◆ Two visits as department chair, two visits as dean, both under EC-2000

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Importance to the Public

- ◆ Protects public health, safety and welfare
- ◆ Identifies programs for the investment of public and private funds

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Importance to the Profession

- ◆ Insures that graduates have met the educational requirements to enter the profession.
- ◆ Enhances the mobility of professionals.
- ◆ Provides professional development for faculty and industry practitioners.
- ◆ Provides opportunity for the profession to guide the educational process to reflect current and future needs.

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Importance to the Institution

- ◆ Recognizes diverse institutional missions and goals
- ◆ Promulgates “best practices” in education
- ◆ Involves faculty and staff in evaluation and planning
- ◆ Establishes eligibility for Federal funding
- ◆ Assists institutions in determining the acceptability of transfer credits

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Importance to the Student

- ◆ Assists prospective students in identifying acceptable programs
- ◆ Permits entry to the profession through licensure/certification
- ◆ Establishes eligibility for Federal student loans, grants and/or scholarships
- ◆ Enhances employment opportunities

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What is Accreditation?

Accreditation is the public recognition that an educational institution or program has met certain standards or criteria.

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Components of Accreditation

- ◆ Quality assurance
- ◆ Non-governmental
- ◆ Voluntary
- ◆ Self-assessment
- ◆ Peer-review
- ◆ Continuing review
(usually every 5 to 10 years)

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Accreditation Process

- ◆ Criteria developed by professional societies, practitioners and educators
- ◆ Self-Study by the institution and program
- ◆ On-site evaluation
- ◆ Publication of lists of accredited programs
- ◆ Periodic re-evaluation

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ABET, Briefly

- ◆ Established in 1932 as Engineer's Council for Professional Development (ECPD)
 - ◆ To unite the engineering and technical professions through the professional societies to examine academic quality
- ◆ Currently accredits applied science, computing, engineering, and technology programs

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ABET Accredits Programs

- Programs Lead to Degrees
- All Paths of Study Must be Accreditable

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ABET Vision:

ABET will provide world leadership in assuring quality and in stimulating innovation in applied science, computing, engineering, and technology education.

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ABET Mission:

ABET serves the public through the promotion and advancement of applied science, computing, engineering, and technology education. ABET will:

- ♦ Accredit educational programs.
- ♦ Promote quality and innovation in education.
- ♦ Consult and assist in the development and advancement of education worldwide in a financially self-sustaining manner.
- ♦ Communicate with our constituencies and the public regarding activities and accomplishments.
- ♦ Anticipate and prepare for the changing environment and the future needs of constituencies.
- ♦ Manage the operations and resources to be effective and fiscally responsible.

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Who Recognizes ABET?

- ♦ Council on Higher Education Accreditation (CHEA)
- ♦ State Boards of Engineering Registration
- ♦ US Patent Office
- ♦ US Reserve Officers Training Corps
- ♦ Accreditors outside the United States

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How is ABET Structured?

- ◆ ABET is a federation of 32 professional engineering & technical societies.
- ◆ ABET Board of Directors approves accreditation policy & criteria.
- ◆ ABET Commissions decide accreditation actions and implement accreditation policy.

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Role of the ABET Accreditation Commissions

- ◆ Evaluate educational programs at colleges and universities.
- ◆ Decide accreditation actions.
- ◆ Recommend changes in the criteria used to evaluate programs.
- ◆ Represented by members of professional & technical societies.

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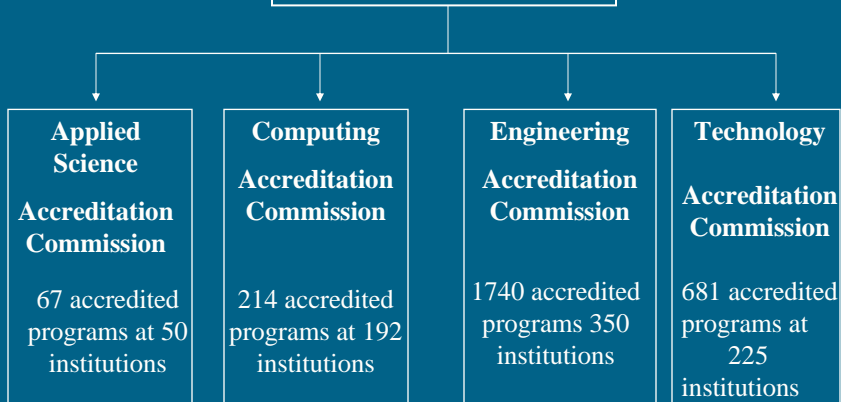
Current Statistics

- ◆ 2,702 programs accredited
- ◆ 562 institutions
- ◆ More than 1,500 volunteers

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ABET Board

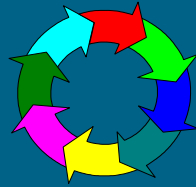


Sept 2004

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The Paradigm Shift



Outcomes-based Accreditation

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CATALYST FOR CHANGE

- ◆ PROLIFERATION OF CRITERIA
- ◆ NEED FOR INNOVATION IN PROGRAMS
- ◆ PRESCRIPTIVITY OF CRITERIA
- ◆ INDUSTRY CALL FOR CHANGE

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Engineering Criteria 2000

- ◆ Less prescriptive and cumbersome.
- ◆ Reduced from 18 pages to 3.
- ◆ Retained best elements of previous criteria:
 - ◆ General and program-specific criteria
 - ◆ General – defined broad knowledge and experience base, eliminated duplication.
 - ◆ Program – 2 areas: curricular issues specific to discipline and faculty qualifications.

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The Focus

“More emphasis on what is being learned than on what is being taught.”

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The Theme

“Continuous improvement process of educational outcomes based on objectives linked to an institution’s and a program’s specific mission and goals.”

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New Philosophy

- ◆ Institutions and Programs define mission and objectives to meet the needs of their constituents – enable program differentiation
- ◆ Emphasis on outcomes – preparation for professional practice
- ◆ Programs demonstrate how criteria and educational objectives are being met

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New Emphasis

- ◆ Practice of continuous improvement
 - ◆ Input of Constituencies
 - ◆ Process focus
 - ◆ Outcomes and Assessment Linked to Objectives
- ◆ Knowledge required for entry into the profession
- ◆ Student, faculty, facilities, institutional support, and financial resource issues linked to Program Objectives

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EC 2000 Implementation

- ◆ **1996** Fall -- Pilot Visits – two institutions, 14 programs
- ◆ **1997** Fall – Pilot Visits – three institutions, 16 programs
- ◆ **1998** Fall -- First round phase-in visits - 12 institutions, 54 programs
- ◆ **1999** Fall -- Second round phase-in visits – 46 institutions, 249 programs
- ◆ **2000** Fall -- Third round phase-in visits – 48 institutions, 270 programs

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EC 2000 Implementation (cont.)

- ◆ 2001 Fall – required for all programs going forward
- ◆ 2006-07 all programs will have been evaluated under EC 2000
- ◆ Cumulative – 88% of all accredited programs now under EC2000

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Engineering Criteria 2000

1. Students
2. Program Educational Objectives
3. Program Outcomes and Assessment
4. Professional Component
5. Faculty
6. Facilities
7. Institutional Support & Financial Resources
8. Program Criteria

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Criterion 1. Students

- ◆ The quality and performance of students and graduates is an important success factor
- ◆ To determine success, the institution must evaluate, advise, monitor students
- ◆ Policies/procedures must be in place and enforced.
- ◆ Assure that all students meet all program graduation requirements

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Criterion 2. Program Educational Objectives

- ◆ Detailed Educational Objectives that are consistent with the mission and the criteria
- ◆ A Process, based on needs of constituencies, in which objectives are determined and evaluated
- ◆ A Curriculum and Process that ensures the achievement of these objectives
- ◆ A System of ongoing evaluation that demonstrates achievement of these objectives and uses the results to improve the effectiveness of the program

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Criterion 3. Program Outcomes

- ◆ Demonstrate that graduates have achieved desired outcomes
- ◆ Measure outcomes important to mission and objectives
- ◆ Apply results to further development and continuous improvement of program

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Program Outcomes

- ◆ Engineering programs must demonstrate that their graduates have:
 - a. An ability to apply knowledge of mathematics, science and engineering appropriate to the discipline
 - b. An ability to design and conduct experiments, analyze and interpret data
 - c. An ability to design a system, component, or process to meet desired needs

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Program Outcomes (continued)

- d. An ability to function on multi-disciplinary teams
- e. An ability to identify, formulate, and solve engineering problems
- f. An understanding of professional and ethical responsibility
- g. An ability to communicate effectively

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Program Outcomes (continued)

- h. The broad education necessary to understand the impact of engineering solutions in a societal context
- i. A recognition of the need for, and an ability to engage in life-long learning
- j. A knowledge of contemporary issues
- k. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

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Criterion 4. Professional Component

- ◆ Faculty must assure that the curriculum devotes adequate attention and time to each component, consistent with objectives of the program and institution
- ◆ Preparation for engineering practice
 - Major design experience
- ◆ Subject areas appropriate to engineering

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Professional Component

Major Design Experience

- ◆ A culminating experience, based on knowledge and skills acquired in earlier coursework
- ◆ Must incorporate engineering standards and realistic constraints, including most of the following considerations:
 - Economic
 - Environmental
 - Sustainability
 - Manufacturability
 - Ethical
 - Health and Safety
 - Social
 - Political

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Professional Component

Subject Areas

- ♦ One year of a combination of college level mathematics and basic sciences (some with experimental experience) appropriate to the discipline
- ♦ One and one-half years of engineering topics, consisting of engineering sciences and engineering design appropriate to the student's field of study
- ♦ A General Education component that complements the technical content of the curriculum and is consistent with the program and institution objectives

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Criterion 5. Faculty

- ♦ Sufficient number to achieve program objectives
- ♦ Competent to cover all curricular areas of program
- ♦ Ensure proper guidance of the program, its evaluation and development

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Criterion 6. Facilities

- ◆ Must provide opportunities for students to learn use of modern engineering tools.
- ◆ Classrooms, laboratories, and equipment must be adequate.
- ◆ Computing and information infrastructure must be adequate.

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Criterion 7. Institutional Support and Financial Resources

- ◆ Constructive Leadership
- ◆ Sufficient Financial Resources
- ◆ Technical and Clerical Services

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Criterion 8. Program Criteria

- ◆ Each program must satisfy applicable Program Criteria
 - ◆ Curricular topics
 - ◆ Faculty qualifications
- ◆ Current Program Criteria are on the ABET server on the World Wide Web
- ◆ Must satisfy all Program Criteria implied by title of program

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Foundation of CQI is Assessment

- ◆ Assessment of **inputs & process** only establishes the **"capability"** or **"capacity"** of a program
- ◆ Assessment of **"outcomes"** determines **what is accomplished** with that capability

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New Issues

- ◆ Dual Level Accreditation
 - ◆ Preparation for 5 Year Professional Degree?
- ◆ Extension of International Accreditation Activities

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ABET Strategic Plan

“Consult and assist as requested in the development and advancement of education worldwide in a financially self-sustaining manner.”

ABET Mission

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ABET Strategic Issue #4

Globalization of the professions – industries, the work force, education, and practice – results in an increased need for:

- ◆ Quality assurance for educational programs in other countries
- ◆ Authentication of educational credentials
- ◆ Portability of educational credentials
- ◆ Increased emphasis on communications & interpersonal skills, and a heightened awareness of diversity issues.

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What drove the development of this issue?

- ◆ Requests for evaluation by programs in outside the US
- ◆ Inquiries from employers and state boards about the educational credentials of individuals educated outside the US
 - ◆ How do you know a program is any good?
 - ◆ Who can tell you this?

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What is the desired outcome to address Strategic Issue #4?

- ◆ Determine the quality of educational programs located outside the US

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What are the current strategies for determining the quality of educational programs located outside the US?

- ◆ Develop Mutual Recognition Agreements (MRA) with other accreditors
- ◆ Conduct substantial equivalency evaluations & *limited accreditation*
- ◆ Evaluate educational credentials of individuals

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How has the International Activities Council accomplished this under current policy?

- ◆ Substantial equivalency evaluations (160 programs at 27 schools in **15 countries**)
- ◆ ECEI (5,030 credentials from 1,287 schools in **130 countries**)
- ◆ Faculty & Accreditation System Workshops (**11 countries**)

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How has the ABET Board of Directors accomplished this under current policy?

- ◆ Memoranda of Understanding (Agreements to exchange information/observers) - **10 countries**
- ◆ Mutual Recognition Agreements (Recognition of accreditation systems)
Washington Accord: **14 countries**

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How have the ABET Commissions accomplished this under current policy?

- ◆ Accreditation when institution meets eligibility requirements
 - ◆ Regional or Institutional accreditation
 - ◆ Incorporated/licensed in US
- ◆ 3 programs **outside the US** currently accredited
- ◆ 6 programs **outside the US** in process
- ◆ Requests from several schools pending

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**The committee shall formulate
and recommend for approval
by the Board of Directors,
policies and procedures
regarding international
activities of ABET.**

2004-05 Charge to INTAC

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Question to the Board

Should we change the policy limiting accreditation outside the US in order to better

- ◆ implement the ABET Vision & Mission, and
- ◆ respond to Strategic Issue #4?

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Washington Accord

... recognizes the "substantial equivalency" of accreditation systems to assess that the graduates of accredited programs are prepared to practice engineering at the entry level to the profession.

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Washington Accord Agreement

SIGNATORIES

AUSTRALIA-IEAust
CANADA-CCPE
HONG KONG-HKIE
IRELAND-IEI
JAPAN-JABEE

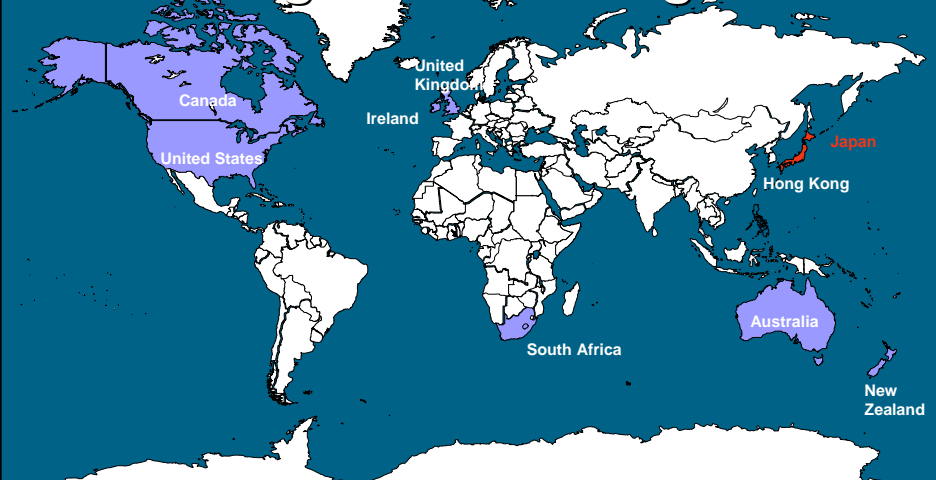
NEW ZEALAND-IPENZ
SOUTH AFRICA-ECSA
UNITED KINGDOM-EC
UNITED STATES-ABET

Provisional Members

GERMANY – ASIIN (2003)
KOREA – ABEEK (2005)
MALAYSIA – BEM (2003)
SINGAPORE - IES (2003)
TAIWAN – IEET (2005)

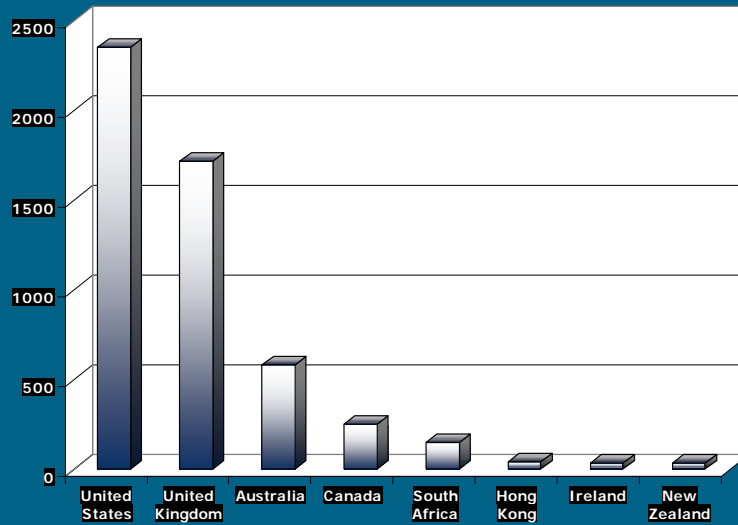


Washington Accord Signatories





Washington Accord Programs Recognized by ABET



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THANK YOU!

Questions?

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