ABET
Computing Accreditation Commission

Ben Huey, CAC Chair
Computing Research Association
Snowbird, Utah
July 15, 2002
Objectives for Talk

• Why Accreditation?
• ABET Organization and Operation
• Activities in progress
• Criteria - Philosophy, Content
Why Accreditation?
Why Accreditation?

Institutional Perspective

• Does industry use it to guide hiring?
• Does it identify us with the right institutions?
• Does it assist us with recruiting the students we want?
• Does it provide us with meaningful information to guide development of our programs and in allocating our resources?
Why Accreditation?

Industry Perspective

• Does it help industry in defining what graduates need to know?
• Does it help industry to have the “leverage” to insure that a large body of institutions are responding to its needs?
• Does it provide a useful measure of which graduates are well prepared?
Why Accreditation?

Student Perspective

• Does it help in knowing where to invest time and money for education?
  – Appropriate curriculum content
  – Quality of learning experience
  – Robustness of the institution

• Is it an indicator of opportunities for employment?
  – Preparation for lifetime learning?
Why Accreditation?

In the face of change!

• Computing a rapidly changing field
  – Accreditation a help or hindrance?
  – Criteria address mechanisms for continuous change
  – Absence of professional licensure

• Role of tradition relative to change
  – Firm soil for growing mighty trees or
  – Petrifaction of old growth?
  – A choice and a challenge for institutions, industry, and ABET
Organization and Background
ABET

- Primary organization responsible for monitoring, evaluating, and certifying the quality of engineering, engineering technology, and engineering related education in the United States

- Federation of 29 technical and professional societies representing over 1.8 million practicing professionals
ABET Board

- **Engineering Accreditation Commission**
  - 1555 accredited programs at 323 institutions

- **Technology Accreditation Commission**
  - 729 accredited programs at 242 institutions

- **Applied Sciences Accreditation Commission**
  - 53 accredited programs at 37 institutions

- **Computing Accreditation Commission**
  - 171 accredited programs at 164 institutions

Governance
Who Accredits What?

ABET

EAC
- Computer Engineering
- Software Engineering
- Other engineering

TAC
- Computer Technology
- Software Technology

ASAC

CAC
- Computer Science
- Information Systems
Responsibilities of ABET Board of Directors and the CAC

- **Board of Directors**
  - Approves policy
  - Approves criteria
  - Considers appeals of not-to-accredit decisions

- **CAC**
  - Recommends criteria
  - Conducts the accreditation process
  - Assigns Team Chairs
  - Makes final accreditation decision by vote of entire membership
CSAB

• Consists of
  – IEEE Computer Society
  – ACM
  – AIS
• Two members on ABET Board

• Lead or participating body
  – Programs
    • Computing Science
    • Information Systems
    • Software Engineering
    • Computer Engineering
  – What it does
    • Proposes criteria
    • Provides program evaluators
    • Nominates commission members
ABET Accredits Programs

• Programs Lead to Degrees

• A program is described by
  - Objectives
  - Outcomes
  - Curriculum

• Transcript is Primary Evidence of Degree
Activities in Progress
Accreditation Activities

- Visiting and accrediting Computer Science programs. >175 programs, 30-40 institutional visits each year. 20% growth in coming year
- Pilot visit for Information Systems done in 2001. Seven IS programs to be visited in 2002
- Meeting with parties interested in establishing Information Technology accreditation.
Organization / Culture

- Integration of activities into ABET system still in progress
- Changing ABET perspectives on scope of programs affected, rationale for accreditation
- Development of own internal improvement processes
Participation in ABET Initiatives

• Participation in Sloan Foundation study on meaning of “Laboratory” and implications for distance / online education.
• Transcript evaluation processes from international programs
• Participation in INTACT (international accreditation activities)
Criteria

Basis for Accreditation
Objectives of Accreditation

(1) Assure that graduates of an accredited program are adequately prepared to enter and continue the practice of computing professionals

(2) Stimulate the improvement of educating computing professionals

(3) Encourage new and innovative approaches to engineering education and its assessment

(4) Identify accredited programs to the public
Philosophy

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

• Practice of continuous improvement
  – Input of Constituencies
  – Process focus
  – Outcomes and Assessment linked to Objectives

• Knowledge required for entry to the profession

• Student, Faculty, Facilities, Institutional Support, and Financial Resource issues linked to Program Objectives
Intent of the Criteria

**Intent** of the criteria is to:

State principles to be applied with *judgment* rather than as rigid standards

Afford *flexibility* to meet institutional objectives

Encourage innovative programs
Criteria Categories

- Objectives and Assessments
- Student Support
- Faculty
- Curriculum
- Laboratory and Computing Facilities
- Institutional Support and Financial Resources
- Institutional Facilities
Comparison of Program Criteria

<table>
<thead>
<tr>
<th></th>
<th>Info Sys</th>
<th>Comp Sci</th>
<th>Comp Eng</th>
<th>Soft Eng</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Major</strong></td>
<td>30 hrs. IS + 15 in IS environ. Core: 12 hr. Adv: 12 hr.</td>
<td>40 hrs. CS, Core: 16 hr. Adv: 16 hr.</td>
<td>Consistent w/ objectives.</td>
<td>Consistent w/ objectives</td>
</tr>
<tr>
<td><strong>Math</strong></td>
<td>9 hrs. beyond pre-calc. Calc or discrete, statistics</td>
<td>15 hrs., incl. calculus, discrete math, prob., stat.</td>
<td>Calculus, DE, discrete math, prob., stat</td>
<td>Calculus, DE, discrete math, prob., stat</td>
</tr>
<tr>
<td><strong>Science</strong></td>
<td>No requirement</td>
<td>2 sem. lab science, 12 units total. 30 hrs. Math+Sci</td>
<td>2 sem lab chem or physics, + sem. of other</td>
<td>2 sem lab chem or physics, + sem. of other</td>
</tr>
</tbody>
</table>
### Comparison of Program Criteria

<table>
<thead>
<tr>
<th>Faculty</th>
<th>Info Sys</th>
<th>Comp Sci</th>
<th>Comp Eng</th>
<th>Soft Eng</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Qualified, Some Ph.D.’s in IS or related. Weaker FT rqt.</td>
<td>ABET std + Some Ph.D.’s in CS.</td>
<td>Competent, qualified, sufficiently large and diverse</td>
<td>Competent, qualified, sufficiently large and diverse</td>
</tr>
<tr>
<td>Commission</td>
<td>CAC</td>
<td>CAC</td>
<td>EAC</td>
<td>EAC</td>
</tr>
<tr>
<td>Society (ies)</td>
<td>CSAB</td>
<td>CSAB</td>
<td>IEEE (CSAB)</td>
<td>CSAB (IEEE)</td>
</tr>
</tbody>
</table>
What is an Intent statement?

- An Intent statement is a high level description of a program that conforms to a particular Criteria Category.
- In order to be accreditable, a program must meet the Intent statement of every Category.
- Example from Faculty Category:

  Faculty members are current and active in the discipline and have the necessary technical breadth and depth to support a modern computer science program. There are enough faculty members to provide continuity and stability, to cover the curriculum reasonably, and to allow an appropriate mix of teaching and scholarly activity.
What is a Standard?

- Standards are a series of enumerated statements of how to minimally meet the Intent of a particular Category.
- Standards are both qualitative and quantitative.
- Standards define minimum essential elements.
- A program that satisfies all the Standards of a Category meets the Intent of that Category.
- A program that does not satisfy one or more of the Standards of a Category but demonstrates an alternative approach to meeting the Intent of that Category is still accreditable.
Examples of Standards

• Category: Faculty

• Three of the nine standards in the Category:
  
  – III-1. There must be enough full-time faculty members with primary commitment to the program to provide continuity and stability.
  
  – III-4. The interests and qualifications of the faculty members must be sufficient to teach the courses and to plan and modify the courses and curriculum.
  
  – III-8. All full-time faculty must have sufficient time for scholarly activities and professional development.
Differences between 1996 Criteria and Criteria 2000

- Structure and style
- Additional emphasis on program objectives and assessment of program effectiveness
- *Intent* concept provides more explicit means for accreditation of innovative programs
  - reasonable departure from the Standards is acceptable if Intent of Category is met
  - institution must present rationale to visiting team
- Many former quantitative criteria included as Guidance
- Few other significant substantive changes
Criteria and Guidance

- Two documents for each program
  - *Criteria for Accrediting Computer Science Programs in the United States*
    - seven *Categories*
    - each category is divided into
      - *Intent*
      - *Standards*
  - *Guidance for Interpreting the Criteria for Accrediting Programs in Computer Science in the United States*
    - seven sections -- one per criteria category
    - contents mapped to specific Standards
Changes in the last two years

- ABET Constituency extended beyond engineering
- Visit alignment, focused visits
- Coordination of visits
- Accreditation actions
- “Weaknesses” and “Concerns”
- How Team Chairs and Program Evaluators are selected / trained
- Commission size and selection
- Internal processes
A Good Thing?

- Enhanced position in defining roles in accreditation of all computing related disciplines
- 20% increase this year in the number of programs to visit
- Still difficult to keep perspectives on CS from being shifted toward engineering as a consequence, but this is being recognized and addressed
ABET Constituency Changing

- Extended beyond engineering to Colleges of Arts and Sciences, and even Colleges of Business
- Must demonstrate that accreditation provides value
- Must provide more orientation, guidance, training -- especially on outcomes assessment
Visit alignment, focused visits

- Need to balance the number of visits conducted each year
- Institutions desire to align CAC visits with those of other commissions (primarily EAC)
- Concerns from preceding visit can be reviewed by a single person
- For previously 6V accredited programs, extension may be done administratively without even a focused visit.
Types of Evaluation

- **Comprehensive** - evaluations of all programs under the purview of a particular Commission must be conducted simultaneously every six years.

- **Focused** - evaluations occur when a program was found to have deficiencies or weaknesses in the prior evaluation.
Joint Visits, Simultaneous Visits

- Computer Science & Engineering programs JOINTLY visited by EAC and CAC. TC from CAC, PEV from EAC.

- CAC may visit a CS program SIMULTANEOUSLY with an EAC visit to engineering. Two separate teams, but TC’s may combine appointments during visit, do a simultaneous exit meeting, share information.

- Requires more advance planning, but works to benefit of the institution.
Accreditation actions – new designations

<table>
<thead>
<tr>
<th>CSAC/CSAB</th>
<th>CAC/ABET</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>6V</strong> (accredit for 6 years)</td>
<td><strong>NGR</strong> (accredit till Next General Review)</td>
</tr>
<tr>
<td><strong>6VR</strong> (accredit for 6 years with interim report after 3 yrs.)</td>
<td><strong>IR</strong> (accredit till interim report), <strong>RE</strong> (after interim report extend to NGR)</td>
</tr>
<tr>
<td><strong>3V</strong> (accredit for 3 years)</td>
<td><strong>IV</strong> (accredit till interim visit), <strong>RE</strong> (following interim visit extend to NGR)</td>
</tr>
</tbody>
</table>
### Actions and Durations

<table>
<thead>
<tr>
<th>Weakness</th>
<th>Deficiency</th>
<th>Action</th>
<th>Duration [years]</th>
</tr>
</thead>
<tbody>
<tr>
<td>no</td>
<td>no</td>
<td>NGR</td>
<td>Next General Review</td>
</tr>
<tr>
<td>yes</td>
<td>no</td>
<td>IR</td>
<td>Interim Report</td>
</tr>
<tr>
<td>yes</td>
<td>no</td>
<td>IV</td>
<td>Interim Visit</td>
</tr>
<tr>
<td>--</td>
<td>yes</td>
<td>SC</td>
<td>Show Cause</td>
</tr>
</tbody>
</table>
### Actions and Durations

#### Interim

<table>
<thead>
<tr>
<th>Weak?</th>
<th>Def?</th>
<th>Action</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>no</td>
<td>no</td>
<td>RE Report Extended</td>
<td>2-4 years</td>
</tr>
<tr>
<td>no</td>
<td>no</td>
<td>VE Visit Extended</td>
<td>2-4 years</td>
</tr>
<tr>
<td>no</td>
<td>no</td>
<td>SE Show Cause Extended</td>
<td>1-3-5 years</td>
</tr>
<tr>
<td>yes</td>
<td>no</td>
<td>IR Interim Report</td>
<td>2 years</td>
</tr>
<tr>
<td>yes</td>
<td>no</td>
<td>IV Interim Visit</td>
<td>2 years</td>
</tr>
<tr>
<td>--</td>
<td>yes</td>
<td>SC Show Cause</td>
<td>1 year</td>
</tr>
</tbody>
</table>
“Weaknesses” and “Concerns”

- **Concern** -- criterion is satisfied, but **potential** exists for non-satisfaction in the near future.

- **Weakness** -- criterion is satisfied, but **lacks strength of compliance** to assure the quality of the program will not be compromised prior to next general review. – *AFFECTS DURATION OF ACCREDITATION ACTION*
How Team Chairs and Program Evaluators are selected / trained

- Team Chairs are selected, trained, assigned, and evaluated by the Commission

- Program Evaluators are selected, trained, assigned, and evaluated by CSAB (the Participating Body that consists of IEEE, ACM, and AIS)
**Commission size and selection**

- **CSAC/CSAB (history):** Every Team Chair was automatically a member of the Commission in the year they led a visit.
- **CAC/ABET (future):** A fixed size commission of 22+ExCom based upon an ABET formula related to the number of programs accredited.
- **CSAB nominate, CAC members elect new Commission members.**
- **During transition process all TC’s vote, but number of TC’s to shrink annually and 4-5 permanent members elected till these converge.**
Internal processes

- Cross commission group working to find common language and processes that span commissions, reduce confusion both externally and simplify work of HQ
- Effort to identify best practices across commissions
- Instituting internal quality improvement processes
Web Site

• For more information

www.abet.org

Click on

➤ Accreditation
  ➤ Information for Programs and Institutions