



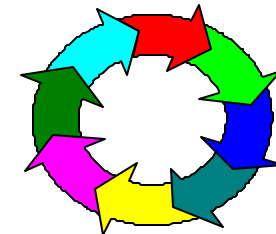
# ABET Computing Accreditation Commission

*Ben Huey, CAC Chair*

*Computing Research Association*

*Snowbird, Utah*

*July 15, 2002*



July 2002



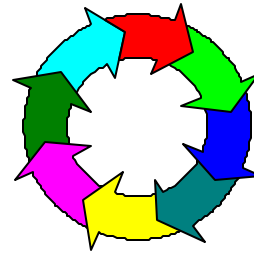
# *Objectives for Talk*

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



# Why Accreditation?





# *Why Accreditation?*

## *Institutional Perspective*

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- 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*

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- 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*

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- 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?*

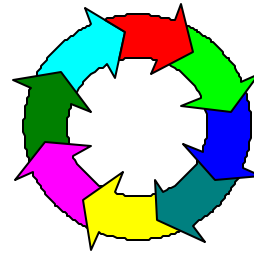
## *In the face of change!*

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- 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*
  - Petrification of old growth?
  - *A choice and a challenge for institutions, industry, and ABET*



# Organization and Background







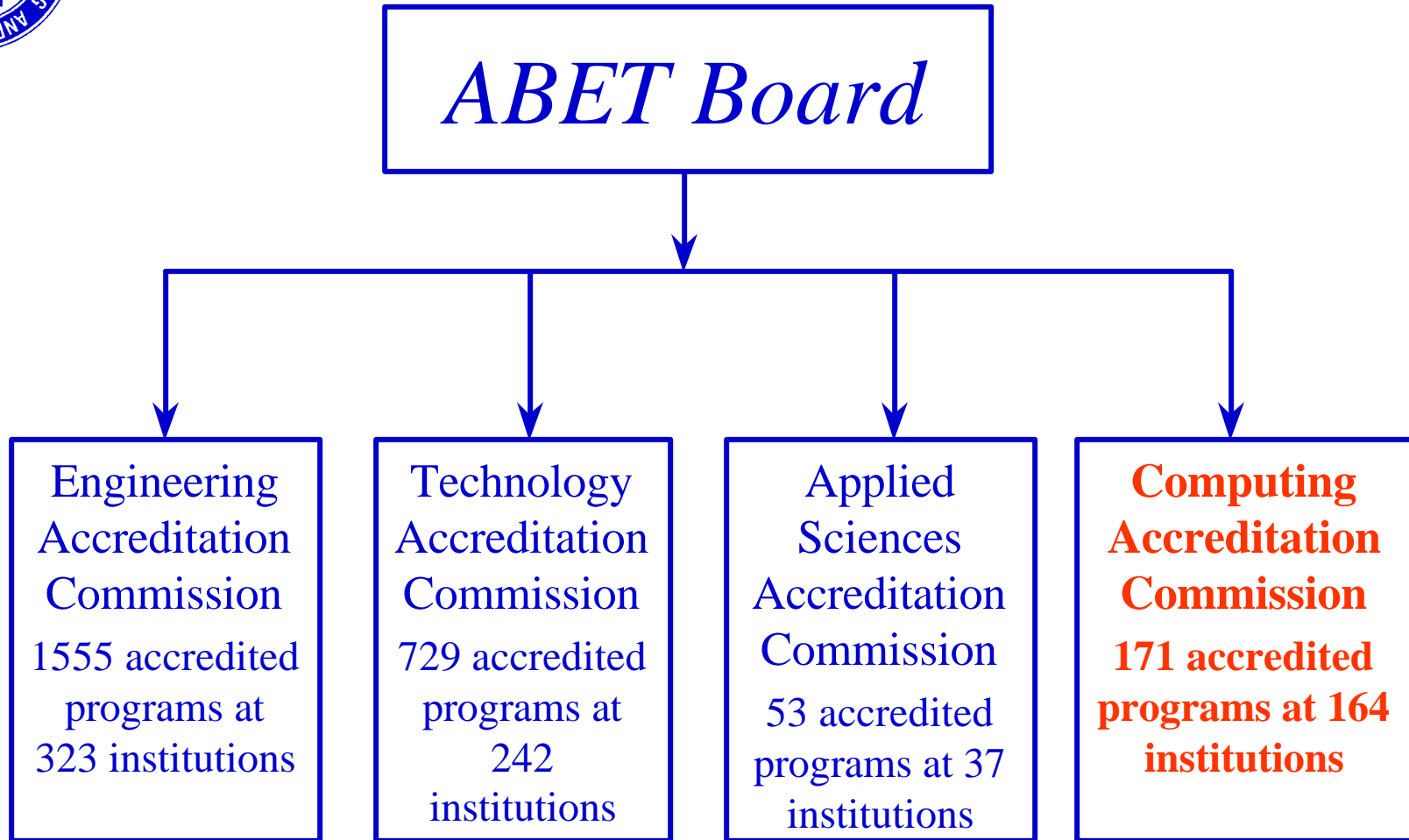
# *ABET*

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- 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

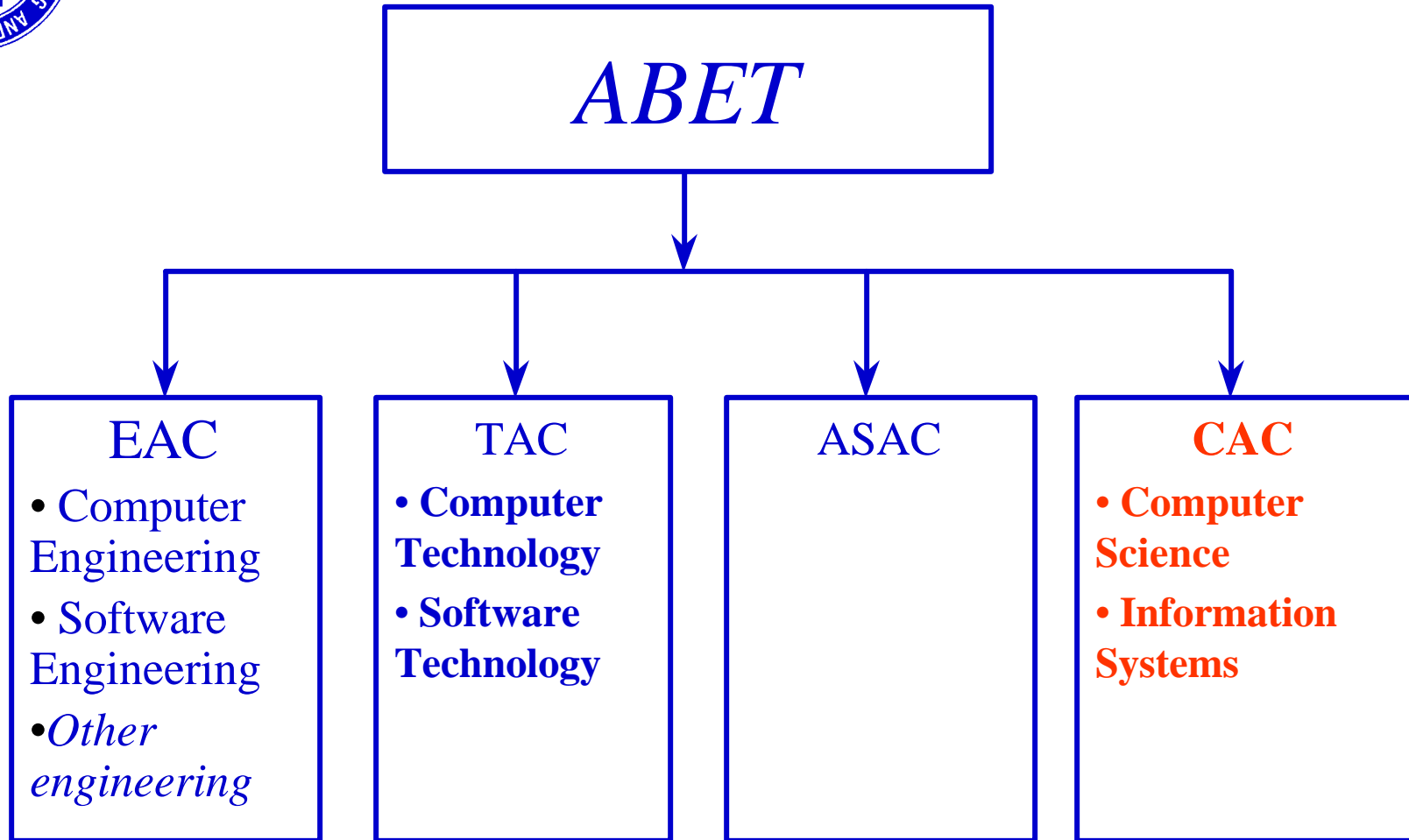


# Governance





# Who Accredits What?





# *Responsibilities of ABET Board of Directors and the CAC*

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- **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

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- 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



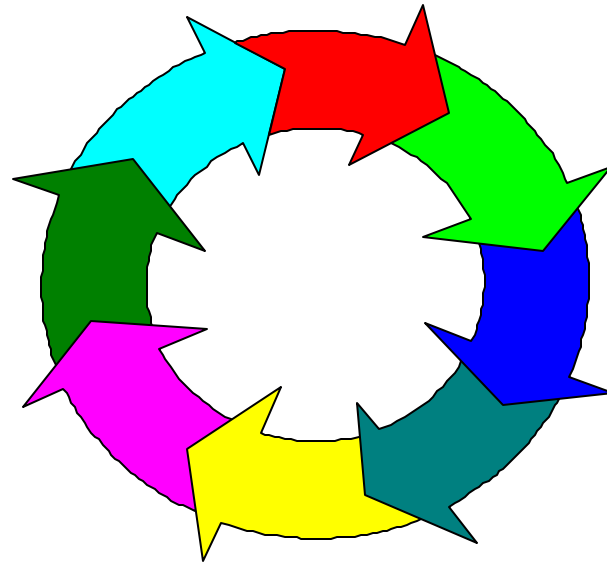
# *ABET Accredits Programs*

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- *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



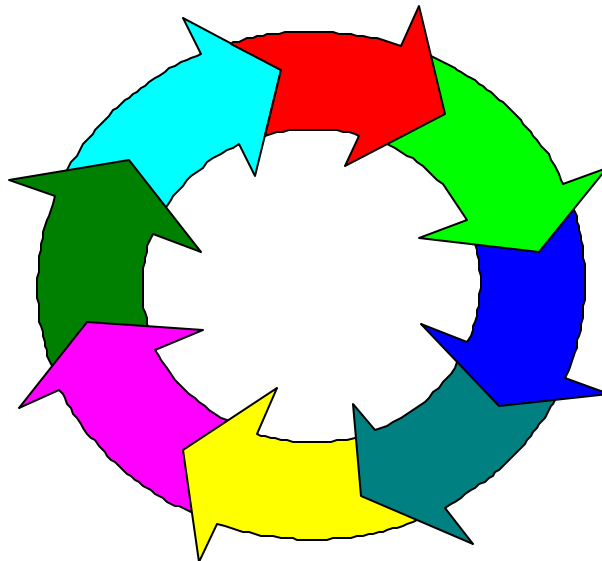
## *Participation in ABET Initiatives*

- 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*

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- (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*

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- 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*

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- 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*

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**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*

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- Objectives and Assessments
- Student Support
- Faculty
- Curriculum
- Laboratory and Computing Facilities
- Institutional Support and Financial Resources
- Institutional Facilities





# Comparison of Program Criteria

	Info Sys	Comp Sci	Comp Eng	Soft Eng
Major	30 hrs. IS + 15 in IS environ. Core: 12 hr. Adv: 12 hr.	40 hrs. CS, Core: 16 hr. Adv: 16 hr.	Consistent w/ objectives.	Consistent w/ objectives
Content	Incl. HW/SW, prog., data mgt., NW/TC; theory, anal, design	Incl. algorithms, data struct., SW des., pgmg lang, org/arch; theory, anal, des.	Computer Science, Eng. Science Software and Systems	Computer Science, Eng. Science Software and Systems
Math	9 hrs. beyond pre-calc. Calc or discrete, statistics	15 hrs., incl. calculus, discrete math, prob., stat.	Calculus, DE, discrete math, prob., stat	Calculus, DE, discrete math, prob., stat
Science	No requirement	2 sem. lab science, 12 units total. 30 hrs. Math+Sci	2 sem lab chem or physics, + sem. of other	2 sem lab chem or physics, + sem. of other



# Comparison of Program Criteria

	Info Sys	Comp Sci	Comp Eng	Soft Eng
Faculty	Qualified, Some Ph.D.'s in IS or related. Weaker FT rqt.	ABET std + Some Ph.D.'s in CS.	Competent, qualified, sufficiently large and diverse	Competent, qualified, sufficiently large and diverse
<b>Commission</b>	CAC	CAC	EAC	EAC
Society (ies)	CSAB	CSAB	IEEE (CSAB)	CSAB (IEEE)



# *What is an Intent statement?*

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- 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?

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- 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 creditable.



# *Examples of Standards*

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- 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*

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- 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*

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- 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*

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- **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*

<b>CSAC/CSAB</b>	<b>CAC/ABET</b>
<b>6V</b> (accredit for 6 years)	<b>NGR</b> (accredit till Next General Review)
<b>6VR</b> (accredit for 6 years with interim report after 3 yrs.)	<b>IR</b> (accredit till interim report), <b>RE</b> (after interim report extend to NGR)
<b>3V</b> (accredit for 3 years)	<b>IV</b> (accredit till interim visit), <b>RE</b> (following interim visit extend to NGR)



# *Actions and Durations*

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## General

<b>Weakness Deficiency</b>		<b>Action</b>		<b>Duration [years]</b>
no	no	NGR	Next General Review	6
yes	no	IR	Interim Report	2
yes	no	IV	Interim Visit	2
--	yes	SC	Show Cause	1



# *Actions and Durations*

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## Interim

<b>Weak?</b>	<b>Def?</b>	<b>Action</b>	<b>Duration [years]</b>
no	no	RE Report Extended	2-4
no	no	VE Visit Extended	2-4
no	no	SE Show Cause Extended	1-3-5
yes	no	IR Interim Report	2
yes	no	IV Interim Visit	2
--	yes	SC Show Cause	1





## “Weaknesses” and “Concerns”

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- **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

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- **For more information**

**[www.abet.org](http://www.abet.org)**

**Click on**

➤ **Accreditation**

➤ **Information for Programs and Institutions**