ABET is coming!

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ABET is a quality assurance organization for technical education. It is considered the gold standard in this arena.
Why ABET Accreditation?

General Reasons

- Ensures that graduates have met the educational requirements necessary to enter the profession.
- Provides opportunities for the industry to guide the educational process to reflect current and future needs.
- Enhances the mobility of professionals.
- Facilitates faculty mobility
Why ABET Accreditation?

CSUF-specific Reasons

- The Chancellor mandates that all computer science programs are ABET accredited
- Federal funding flows only to ABET accredited programs
ABET and its Commissions

EAC
Engineering Accreditation Commission

ETAC
Engineering Technology Accreditation Commission

CAC
Computing Accreditation Commission

ANAC
Applied & Natural Science Accreditation Commission
Composition of Engineering Accreditation Commission

- IEEE
- ASCE
- ASME
- ASChE
- ASIE
- ASEE
- SME
- ...

- NCEES
Composition of Computing Accreditation Commission

- CSAB
- IEEE-CS
- ...
Accreditation Timeline
18-21* Month Process

2019
September

2020 January
Institution requests review of programs
November* Readiness Review (if required)

2020 March – June
Team members assigned, dates set, Self-Study Report submitted

2020 April
Draft statements edited and sent to institutions

2020 May – June
Necessary changes to statement, if any, are made

2021 August
Institutions notified of final action

2021 July
Commission meets to take final action

2020 February – May
Institution prepares self-evaluation (Program Self-Study Report)

2020 September – December
Visits take place, draft statements written and finalized following 7-day response period

2020 January – April
Institutions respond to draft statement and return to ABET

2021 October
Accreditation status publicly released
Immediate tasks on hand

- Fine tune the Major Project course
- Complete the assessment and evaluation process
- Implement and document continuous improvement activities
- Complete the collection of ALL course syllabi in the 2-page ABET format. (Distributed earlier. Appendix A in the Self-Study Report) Late.
- Collect ALL faculty CV in the 2-page ABET format. (Distributed earlier. Appendix B in the SSR.) Late.
- Prepare equipment list (Appendix C in the SSR)
- Prepare Institutional Summary (Appendix D in the SSR)
- Begin collecting information for writing the SSR.
Objectives of the Campus Visit

- Make a qualitative assessment of factors that cannot be documented in the written Self-Study Report
- Conduct a detailed examination of the materials compiled by the institution
  - What do the students actually do?
  - Are the processes described in Self-Study Report sufficiently demonstrated?
- Interview faculty, staff, students and administration
- Provide the institution with a preliminary assessment of its strengths and shortcomings
- Assist the institution and its programs in quality improvement efforts
ABET Speaks in tongues...

- The review is focused on programs, so the applicable terms are applied in the context of programs.

- There are four keywords:
  - Deficiency
  - Weakness
  - Concern
  - Observation – “friendly advice”
Terminology

• **Deficiency** – criterion, policy, or procedure is *NOT* satisfied.

• **Weakness** – *lacks the strength of compliance* with a criterion, policy, or procedure to ensure that the quality of the program will not be compromised.

• **Concern** – criterion policy, or procedure is satisfied; however, the *potential* exists for the situation to change such that the criterion, policy, or procedure may not be satisfied
Working Definition of Key Terms

- **Deficiency**: assigned to any criterion, policy, or procedure that is totally or largely unmet

- **Weakness**: criterion, policy, or procedure is met to some meaningful extent, but compliance is insufficient to fully satisfy requirements

- **Concern**: criterion, policy, or procedure is fully met, but there is potential for non-compliance in the near future

- **Observation**: general commentary possibly, but not necessarily, related to criteria
Concern, Weakness and Deficiency
Criterion 1: Students

Questions asked...

❖ Evaluate student performance
❖ Monitor student progress
❖ Advise students regarding curricular and career matters
❖ Have and enforce policies for accepting both new and transfer students
❖ Have and enforce policies for awarding academic credit for courses taken at other institutions
❖ Have and enforce policies for awarding academic credit for work in lieu of courses taken at the institution
❖ Have and enforce procedures to ensure and document that students who graduate meet all graduation requirements
Criterion 2: Program Educational Objectives (PEOs)

Definition:

PEOs “are broad statements that describe what graduates are expected to attain within a few years after graduation.”

Requirements:

• Published PEOs, consistent with mission of institution, needs of constituencies, and these criteria

• A documented, systematically utilized, effective process, involving program constituencies, for periodic review and revision of PEOs that ensures they remain consistent with institutional mission, constituency needs, and these criteria
Program Educational Objectives: Issues

• If the published PEOs do not satisfy the definition of broad statements that describe what the graduates are expected to attain within a few years after graduation, then the program has a Criterion 2 shortcoming.

• If the program fails to convince the team that the PEOs are consistent with constituency needs, then the program has a Criterion 2 shortcoming.

• If the program does not have a documented, systematic and effective process, involving program constituencies, for the periodic review and revision of PEOs, then the program has a Criterion 2 shortcoming.
Criterion 3: Student Outcomes (SOs): Definition & Requirements

Definition:
Student outcomes describe what students are expected to know and be able to do by the time of graduation (skills, knowledge, and behaviors)

Requirements:
Student outcomes are (1) though (5) plus one more for Computer Science

The program must have documented student outcomes that prepare the graduates to attain the PEOs
Assessment is one or more processes that identify, collect, and prepare data to evaluate the attainment of student outcomes.

Effective assessment uses relevant direct, indirect, quantitative and qualitative measures as appropriate to the outcome being measured.

Appropriate sampling methods may be used as part of an assessment process.

Evaluation is one or more processes for interpreting the data and evidence accumulated through assessment processes.

Evaluation determines the extent to which student outcomes are being attained. Evaluation results in decisions and actions regarding program improvement.
Criterion 4: Continuous Improvement

- The program must regularly use appropriate, documented processes for assessing and evaluating the extent to which the SOs are being attained.

- **Assessment of attainment of PEOs is not required.**

- The results of these evaluations must be systematically utilized as input for continuous improvement of the program.

- Other available information may also be used to assist in continuous improvement.
Criterion 4: Questions PEVs Ask

- Are all SOs being regularly assessed and evaluated?
  - (1) though (6)
  Do the assessment tools and evaluation processes determine the extent to which the SOs are being attained?

- Are the results systematically utilized as input for continuous improvement of the program?
Criterion 4: Consistency

- Be sure to apply this criterion in a **holistic** sense.
  - Shortcomings are judged based on the evidence for the criterion as a whole.
  - Holistic evaluation is NOT license to ignore parts of the criterion – if a shortcoming is identified, then the program has a finding.
- The process of assessment and evaluation needs to demonstrate the extent to which outcomes are attained.
- No requirement says
  - all outcomes must be attained to the same degree, or
  - a numeric scale must be used to measure degree of attainment.
Criterion 4 Issues

- The program has been making changes, but none are related to assessment of SOs.
  - If evidence shows these results are NOT being used as input to the improvement process, then the program has a Criterion 4 shortcoming.

- A program has rewritten the SOs and is assessing them, but their list does not include all of the Criterion 3 outcomes.
  - If a Criterion 3 (1-6) SO is not assessed, then the program has a Criterion 4 shortcoming.
Criterion 4 Assessment Data: FAQs

• Do all assessment data have to be objective/direct? (NO!)

• Can assessment data be subjective? (Some of it may be subjective. However, the evaluation should not be based only on subjective assessment.)

• Is the observation or conclusion of a course instructor adequate? (It depends on his or her basis for the observation or conclusion.)

• Does evidence for each outcome have to be in the form of work the student has produced? (No, but the team needs to be convinced that the extent to which student outcomes are attained has been determined.)
Criterion 5 Curriculum

- The curriculum requirements specify subject areas appropriate to computer science but do not prescribe specific courses.
- Basic sciences are defined as biological, chemical, and physical sciences.
Criterion 5 Curriculum

The program’s requirements must be consistent with its program educational objectives and designed in such a way that each of the student outcomes can be attained.

The curriculum must combine technical, professional, and general education components to prepare students for a career, further study, and lifelong professional development in the computing discipline associated with the program.
Criterion 5 Curriculum (contd…)

The curriculum requirements specify topics, but do not prescribe specific courses. The program must include mathematics appropriate to the discipline and at least 30 semester credit hours (or equivalent) of up-to-date coverage of fundamental and advanced computing topics that provide both breadth and depth. The computing topics must include:

1. Techniques, skills, and tools necessary for computing practice.
2. Principles and practices for secure computing.
3. Local and global impacts of computing solutions on individuals, organizations, and society.
Criterion 5 Curriculum (Program Criteria)

4. The study of computing-based systems at varying levels of abstraction.

5. A major project that requires integration and application of knowledge and skills acquired in earlier course work. Mathematics: At least 15 semester credit hours (or equivalent) that must include discrete mathematics and must have mathematical rigor at least equivalent to introductory calculus. The additional mathematics might include course work in areas such as calculus, linear algebra, numerical methods, probability, statistics, or number theory.
Criterion 5 Curriculum (Program Criteria)

The curriculum requirements specify topics, but do not prescribe specific courses. These requirements are:

Computer science: At least 40 semester credit hours (or equivalent) that must include:

1. Substantial coverage of algorithms and complexity, computer science theory, concepts of programming languages, and software development.
2. Substantial coverage of at least one general-purpose programming language.
3. Exposure to computer architecture and organization, information management, networking and communication, operating systems, and parallel and distributed computing.
Criterion 5 Curriculum *Program Criteria*

At least six semester credit hours (or equivalent) in natural science course work intended for science and engineering majors. This course work must develop an understanding of the scientific method and must include laboratory work.
Criterion 6 Faculty

- Sufficient number and competencies to cover all curricular areas
- Adequate levels of student-faculty interaction
- Adequate levels of student advising and counseling
- Adequate levels of university service activities
- Adequate levels of professional development
- Adequate levels of interaction with practitioners and employers
Criterion 6 Faculty (Continued)

- Appropriate qualifications
- Sufficient authority for program guidance and implementation of processes for evaluation, assessment, and continuous improvement
- Overall competence

The overall competence of the faculty may be judged by such factors as education, diversity of backgrounds, engineering experience, teaching effectiveness and experience, ability to communicate, enthusiasm for developing more effective programs, level of scholarship, participation in professional societies, and licensure as Professional Engineers.

Program Criteria: Some full-time faculty members must have a Ph.D. in computer science.
Criterion 7 Facilities
Classrooms, offices, laboratories, and associated equipment must be adequate to support attainment of the student outcomes and to provide an atmosphere conducive to learning. Modern tools, equipment, computing resources, and laboratories appropriate to the program must be available, accessible, and systematically maintained and upgraded to enable students to attain the student outcomes and to support program needs. Students must be provided appropriate guidance regarding the use of the tools, equipment, computing resources, and laboratories available to the program.

The library services and the computing and information infrastructure must be adequate to support the scholarly and professional activities of the students and faculty.
Criterion 7 Facilities

- Adequate to support attainment of student outcomes and provide an atmosphere conducive to learning: classrooms, offices, laboratories, associated equipment
- Modern tools, equipment, computing resources, and laboratories are available, accessible, and systematically maintained and upgraded
- Students provided appropriate guidance regarding the use of the tools, equipment, computing resources, and laboratories
- Adequate library services and computing and information infrastructure
Criterion 8 Institutional Support

- Institutional support and leadership adequate to ensure the quality and continuity of the program
- Institutional services, financial support, and staff adequate to meet program needs
- Sufficient to attract and retain, and provide for the continued professional development of a qualified faculty
- Sufficient to acquire, maintain, and operate infrastructure, facilities, and equipment
- Sufficient to provide an environment to attain student outcomes