

# ABET and “Computer Science”

Some Specifics

Computer Science

University of Wyoming

# ABET Definitions

- Program Educational Objectives
  - “broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve.”
- Program Outcomes
  - “narrower statements that describe what students are expected to know and be able to do by the time of graduation. These relate to skills, knowledge, and behaviors the students acquire in their matriculation through the program.”

# ABET Definitions (cont.)

- Assessment
  - “one or more processes that identify, collect, and prepare data to evaluate the achievement of program outcomes and program educational objectives.”
- Evaluation
  - “one or more processes for interpreting the data and evidence accumulated through assessment practices. Evaluation determines the extent to which program outcomes or program educational objectives are being achieved, and results in decisions and actions to improve the program.”

# General Criteria in Some Depth

- Criterion 1. Students
  - Students can complete the program in a reasonable amount of time.
  - They have ample opportunity to interact with their instructors.
  - Students are offered timely advising, by qualified individuals, about the program's requirements and their career alternatives.
  - Students who graduate from the program meet all program requirements.

# General Criteria (cont.)

- Criterion 2. Program Educational Objectives
  - The program has documented, measurable educational objectives that are based on the needs of the program's constituencies.

# General Criteria (cont.)

- Criterion 3. Program Outcomes
  - The program has documented, measurable outcomes that are based on the needs of the program's constituencies.
  - The program enables students to achieve, by the time of graduation.....(a) thru (i)

# General Criteria (cont.)

- Criterion 4. Continuous Improvement
  - The program uses a documented process incorporating relevant data to regularly assess its program educational objectives and program outcomes, and to evaluate the extent to which they are being met.
  - The results of the evaluations are documented and used to effect continuous improvement of the program through a documented plan.

# General Criteria (cont.)

- Criterion 5. Curriculum
  - Requirements consistent with objectives and outcomes.
  - Combines technical, professional, general and elective elements.
  - Technical and professional requirements include at least one year of up-to-date coverage of fundamental and advanced computing topics.
  - Mathematics appropriate to the discipline beyond pre-calculus level.
  - For each course in major, content, expected performance, and place in program are published.

# General Criteria (cont.)

- Criterion 6. Faculty

- Qualified

- Current and active in discipline.
    - Educational backgrounds and expertise consistent with expected contributions.
    - Collective technical breadth and depth to support program.

- Size and Workload

- Enough full-time faculty to provide continuity, stability.
    - Have appropriate authority for creation, delivery, evaluation and modification of program.

# General Criteria (cont.)

- Criterion 7. Facilities
  - Institutional facilities (library, info retrieval, networks, classrooms, offices) adequate.
  - Computing resources available, accessible, systematically maintained and upgraded.
  - Students and faculty receive appropriate guidance regarding computing resources and labs.

# General Criteria (cont.)

- Criterion 8. Support
  - Institution support for and financial resources available to program are sufficient...
    - To attract and retain qualified faculty.
    - To acquire and maintain computing resources & labs.
    - Provide assurance that program will retain its strength throughout the period of accreditation.

# Program Criteria (Criterion 9)

- Criterion 3
  - Add specific (j) thru (k)
- Criterion 5
  - Computer Science: one and one-third years...
    - Algorithms, data structures, software design, concepts of programming languages, computer organization.
    - Exposure to variety of prog. langs. and systems.
    - Proficiency in at least one higher-level language.
    - Advanced course work that builds on fundamentals.
  - Mathematics: at least one half year
    - Discrete mathematics required! Might include calc, lin alg....
  - Science: combine with math to comprise one year
    - Scientific methods, scientific mode of inquiry, exposure to lab work.
- Criterion 6
  - Some full-time faculty have Ph.D. in computer science.

# The (a) thru (k) for Computer Science

- a) An ability to apply knowledge of computing and mathematics appropriate to the discipline,
- b) An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution,
- c) An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs,
- d) An ability to function effectively on teams to accomplish a common goal,

# The (a) thru (k) for Computer Science

- e) An understanding of professional, ethical, legal, security and social issues and responsibilities,
- f) An ability to communicate effectively with a range of audiences,
- g) An ability to analyze the local and global impact of computing on individuals, organizations and society,
- h) Recognition of the need for and an ability to engage in continuing professional development,

# The (a) thru (k) for Computer Science

- i) An ability to use current techniques, skills, and tools necessary for computing practice.
- j) An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.
- k) An ability to apply design and development principles in the construction of software systems of varying complexity.

# Objectives of the Campus Visit

- Assess factors that cannot be documented easily in a self-study.
- Examine materials compiled by the institution.
- Observe the validity of the self-study.
- Provide a preliminary assessment of program strengths and shortcomings.



# Pre-Visit Activities

## Institutional Perspective (cont.)

- Assemble course displays.
  - One set of materials for each course in major.
    - Syllabus, textbook
    - Assignments, tests, exams
    - Examples of graded student work
    - Consistent “look and feel” is important.
  - Provide access to online material.
    - Give special consideration to distance learning.
- Assemble assessment data.
  - Provide in course display area.



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Computing, Engineering, and Technology Education*

# How Does the Advisory Board Fit In?

- Who are the constituencies?
- Feedback from alumni and employers of alumni?
- A view outside the local fishbowl