

ABET SPECIFIED DEFINITIONS

Basic Science – Basic sciences are disciplines focused on knowledge or understanding of the fundamental aspects of natural phenomena. Basic sciences consist of chemistry and physics and other natural sciences including life, earth, and space sciences. [See Criterion 5 and specific Program Criteria]

College-Level Mathematics – College-level mathematics consists of mathematics that requires a degree of mathematical sophistication at least equivalent to that of introductory calculus. For illustrative purposes, some examples of college-level mathematics include calculus, differential equations, probability, statistics, linear algebra, and discrete mathematics. [See Criterion 5 and specific Program Criteria]

Complex Engineering Problems - Complex engineering problems include one or more of the following characteristics: involving wide-ranging or conflicting technical issues, having no obvious solution, addressing problems not encompassed by current standards and codes, involving diverse groups of stakeholders, including many component parts or sub-problems, involving multiple disciplines, or having significant consequences in a range of contexts. [See Criterion 3, Student Outcome 1]

Engineering Design – Engineering design is a process of devising a system, component, or process to meet desired needs and specifications within constraints. It is an iterative, creative, decision-making process in which the basic sciences, mathematics, and engineering sciences are applied to convert resources into solutions. Engineering design involves identifying opportunities, developing requirements, performing analysis and synthesis, generating multiple solutions, evaluating solutions against requirements, considering risks, and making trade-offs, for the purpose of obtaining a high-quality solution under the given circumstances. For illustrative purposes only, examples of possible constraints include accessibility, aesthetics, codes, constructability, cost, ergonomics, extensibility, functionality, interoperability, legal considerations, maintainability, manufacturability, marketability, policy, regulations, schedule, standards, sustainability, or usability. [See Criterion 5, item b)]

Engineering Science – Engineering sciences are based on mathematics and basic sciences but carry knowledge further toward creative application needed to solve engineering problems. These studies provide a bridge between mathematics and basic sciences on the one hand and engineering practice on the other. [See Criterion 5, item b)]

Team – A team consists of more than one person working toward a common goal and should include individuals of diverse backgrounds, skills, or perspectives. [See Criterion 3, Student Outcome 5]

ADDITIONAL DEFINITIONS

Engineering Standards – Engineering standards are documents that define the characteristics of a product, process or service to meet technical, economic, environmental, and societal challenges. The IEEE is a good source for finding appropriate standards (standards.ieee.org). [See Criterion 5.d)]

Informed Judgement – An informed judgement is based on information, not personal opinion. [See Criterion 3, Student Outcome 4]

Engineering Judgement – Engineering judgement is the ability to decide upon the design, operation, applicability, and/or installation of a product based on the use of appropriate scientific/engineering principles, standards, and practices. [See Criterion 3, Student Outcome 6]

Types of Audiences – Basic audience types include executives, managers, investors, marketers, peers, subordinates, and the general public. The composition of these audiences can include experts, knowledgeable non-experts, and laypersons. Actual audiences may be very specific or be a mixture of these types and compositions. The nature of any of these audiences can be sympathetic, persuadable, apathetic, critical, hostile, or a combination of these. [See Criterion 3, Student Outcome 3]

Learning Strategies – Learning is “the acquisition of knowledge or skills through study, experience, or being taught.” Within the context of ABET Student Outcome 7, “using appropriate learning strategies” means using specific methods to acquire and apply new knowledge, such as:

- Self-study
- Short courses
- Professional conferences/forums
- Review of the professional literature
- Consultation with experts

[See Criterion 3, Student Outcome 7]

Professional Responsibility – Professional responsibility relates to the engineer’s conduct (as described in professional codes of conduct) towards other engineers, employers, clients, and the public. [See Criterion 3, Student Outcome 4]

Inclusive Environment – The characteristics of an inclusive environment include:

- Differences along all cultural dimensions are recognized and valued.
- The multiplicity of ways that people learn, know and communicate are respected.
- Open and honest discussion between members is encouraged.
- Policies and activities which promote understanding and appreciation of other group members are encouraged.
- The “unwritten rules” of the group are understood by all members.
- Flexibility is demonstrated to accommodate differing needs and preferences.

[See Criterion 3, Student Outcome 5]

Public Health, Safety, and Welfare Factors – The term ‘health’ can be defined as a state of well-being of people in both a physiological and psychological sense. ‘Safety’ can be defined as the

absence of hazards and/or physical harm to persons. The term 'welfare' relates to the provision of the basic needs of people. [See Criterion 3, Student Outcome 2]

Cultural Factors – Culture encompasses the set of beliefs, moral values, traditions, language, and laws (or rules of behavior) held in common by a nation, a community, or other defined group of people. [See Criterion 3, Student Outcomes 2]

Economic Context/Factors – Relating to the economy (the system of production, distribution, and consumption of goods and services). [See Criterion 3, Student Outcomes 2 & 4]

Environmental Context/Factors – Concerned with the environment as it relates to living organisms and natural resources. [See Criterion 3, Student Outcomes 2 & 4]

Societal Context/Social Factors – Relating to extended social groups having distinctive cultural, social, political, and/or economic organizations. [See Criterion 3, Student Outcomes 2 & 4]

Global Context/Factors – Relating to world-wide contexts and factors, rather than only local ones. [See Criterion 3, Student Outcomes 2 & 4]