

KEY POINTS ABOUT

Policy Statement 465 (PS 465) of the American Society of Civil Engineers (ASCE)

Academic Prerequisites for Licensure and Professional Practice

Prepared by the Committee on Academic Prerequisites for Professional Practice (CAP³)

1. PS 465 outlines the preparation required by Civil Engineering for **tomorrow's** practice at the professional level. **Future** civil engineers will be faced with an increasingly complex world requiring more **technical depth** and **professional breadth** as they move through the early stages of their engineering career.
2. Formulation and adoption of PS 465 was a **decade long process**. The "**bottom-line**" issue addressed by PS 465 is "The Body of Knowledge (BOK) necessary to effectively practice civil engineering at the professional level is beyond the scope of the traditional bachelor's degree even when coupled with the mandated early-career engineering experience."
3. *Engineering the Future of Civil Engineering* describes the "**why**" of PS 465 (www.asce.org/raisethebar): a new skill and mind set for a new century, education for a complex future, fewer credits, growing complexity, and greater accountability.
4. PS 465 is past the study stage and in the **implementation stage**.
5. The Body of Knowledge (BOK) is the **foundation**—everything builds on it. The BOK defines the knowledge, skills, and attitudes necessary to **enter** the practice of civil engineering at the professional level and is described in the report, *Civil Engineering BOK for the 21st Century: Preparing the Civil Engineer for the Future* www.asce.org/raisethebar.
6. The BOK consists of **15 outcomes**. The outcomes prescribe the necessary depth and breadth of knowledge, skills, and attitudes required of an individual aspiring to enter the practice of civil engineering. They include:

TECHNICAL

- Apply knowledge of math, science and engineering.
- Apply knowledge in a specialized area related to civil engineering.
- Design and conduct experiments as well as to analyze and interpret data.
- Design a system, component or process to meet desired needs.
- Identify, formulate and solve engineering problems.
- Use techniques, skills and modern engineering tools necessary for engineering practice.
- Understand the elements of project, construction and asset management.

PROFESSIONAL

- Function on multidisciplinary teams.
- Understand professional and ethical responsibilities.
- Communicate effectively.
- Know contemporary issues.
- Understand the impact of engineering solutions in a global and societal context.
- Recognize the need for and engage in lifelong learning.
- Understand business, public policy and administration fundamentals.
- Understand the role of a leader and leadership principles & attitudes.

7. Each outcome is supported by a non-prescriptive illustrative commentary. (Pg. 1 of 2)

8. The BOK would be fulfilled by obtaining a Bachelor's plus either a Master's or approximately 30 acceptable credits & experience ("B + M/30 & E"). The "E" in "B + M/30 & E" refers to progressive, structured engineering experience which, when combined with the educational requirements, **results in attainment of the requisite Body of Knowledge**. "B + M/30" represents two different, but related methods to satisfy the educational requirements for entry into the professional practice of civil engineering. Both are equally satisfactory in fulfilling the BOK requirements, which is essential.
- The "B + M" method provides a formal educational program consisting of an acceptable combination of baccalaureate and master's degrees. If the baccalaureate degree **is not** ABET/EAC accredited, the master's degree must be ABET/EAC accredited – once the proposed dual-level accreditation* is implemented. If the baccalaureate degree **is** ABET/EAC accredited, it is expected that the master's degree will be validated by an approved outside agency.
 - The "B + 30" method refers to an educational program consisting of an ABET/EAC accredited baccalaureate degree and approximately 30 semester credits of acceptable graduate-level (or upper-level undergraduate) courses in technical and/or professional practice topic areas. It is required that the baccalaureate degree be an ABET/EAC accredited degree. The "30" program does not have to lead to a master's degree. Some or all of the courses taken as part of a master's program in a related professional practice topic area may be acceptable towards the fulfillment of the "30." It is expected that the "30" program will be validated by an approved outside agency.

In all cases, the overall "B + M" and "B + 30" programs should lead to the fulfillment of the educational component of the Body of Knowledge. The "M" or the "30" can be accomplished equally well by traditional campus-based courses or by distance learning delivery systems. In the future, all of the "30" might be delivered through **independently-evaluated, high-quality, standards-based educational programs offered by firms, government agencies, professional societies, and for-profit educational organizations**. Clearly, **distance learning and independent educational programs** are likely to become more prevalent and important in the future for both degree and non-degree granting programs.

9. University **civil engineering departments** are **participating** with the Committee to undertake curricula design projects. The purpose of these design projects is to **critique** the "B + additional education" relative to the fulfillment of the BOK. Current partners are Colorado State, Iowa State, Case Western Reserve, California State– L.A, Bucknell, Western Michigan, Rose-Hulman Institute of Technology, University of Louisville, Wentworth Institute of Technology, University of Oklahoma, Penn State, Norwich, Georgia Institute of Technology, University of Nebraska, University of Wisconsin – Madison, Northern Arizona, and the United States Military Academy.
10. PS 465 is about the civil engineer of the future. A ten to **fifteen year implementation period** is expected.
11. Members of the various PS 465 implementation committees are **available** to meet with, speak to, and work with interested stakeholders. Some contacts:
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 - Thomas A. Lenox, PhD, ASCE Staff Contact Member to CAP³, tlenox@asce.org.

*Dual-level accreditation will allow universities to voluntarily seek ABET/EAC accreditation for both undergraduate and graduate programs in the same engineering discipline.