

KEY POINTS ABOUT

Policy Statement 465: Academic Prerequisites for Licensure & Professional Practice

Fulfillment & Validation of the Civil Engineering Body of Knowledge

From ASCE's Committee on Academic Prerequisites for Professional Practice (CAP³)

1. Policy Statement 465 (PS 465) outlines the preparation required for entry into **tomorrow's** practice of civil engineering at the professional level. **Future** civil engineers will face an increasingly complex world requiring more **professional breadth** and **specialization**.
2. Formulation 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." PS 465 is in the **implementation stage** -- a ten to fifteen year implementation period is expected.
3. The Civil Engineering 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 *Civil Engineering BOK for the 21st Century: Preparing the Civil Engineer for the Future* (see www.asce.org/raisethebar).
4. 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.

5. Each outcome is supported by a non-prescriptive illustrative commentary.
6. ASCE Policy 465 states that the BOK should be fulfilled by obtaining a Bachelor's plus either a Master's or approximately 30 acceptable credits & experience ("B + M/30 & E"). "B + M/30" represents several different, but related methods to fulfill the formal educational component of the BOK. The "E" refers to progressive, structured engineering experience which, when

combined with the educational requirements, **results in attainment of the requisite Civil Engineering Body of Knowledge.**

7. **The primary path** for fulfilling the Civil Engineering Body of Knowledge in the near future can be symbolized as the following:

$$B^{ABET*} + (M/30)^{Validated} \quad \& \quad E$$

The “B” refers to an ABET/EAC accredited baccalaureate degree in civil engineering. The “M/30” refers to a master’s degree or approximately 30 semester credits of acceptable graduate-level (or upper-level undergraduate) courses in a specialized area related to civil engineering. The “M” signifies a program leading to a master’s degree; the “30” program does not have to lead to a master’s degree. In either case, the “M/30” program will be validated by an approved outside entity.

There is consistency between the ASCE primary path and the Model Law Path currently being explored by the National Council of Examiners for Engineering & Surveying (NCEES) for the licensure of engineers of all engineering disciplines. The NCEES Model Law Path proposes that the future educational requirements for engineering licensure become:

Graduation with a Bachelor of Science degree from an engineering program of four years or more accredited by EAC/ABET, or equivalent, plus 30 additional credits from an approved course provider(s) in upper level undergraduate or graduate level coursework in professional practice and/or technical topic areas.

8. **A secondary path** being explored by ASCE for fulfilling the Civil Engineering Body of Knowledge in the future can be symbolized as the following:

$$B + M^{ABET} \quad \& \quad E$$

While it is not required that the baccalaureate degree associated with this path be an ABET/EAC accredited degree in civil engineering, the master’s degree must be ABET/EAC accredited in civil engineering. ASCE is actively pursuing important modifications to ABET accreditation criteria and policies so that this can serve as a viable pathway for many engineers in the future.

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, Louisville, Florida, Wentworth, Oklahoma, Penn State, Norwich, Georgia Tech, Nebraska – Lincoln, Wisconsin – Madison, Texas – Austin, Northern Arizona, West Virginia, Illinois at Urbana-Champaign, Tennessee Tech, Texas – Tyler, Wyoming, and the United States Military Academy.
10. Members of the various PS 465 implementation committees are **available** to meet with, speak to, and work with interested stakeholders. Some primary contacts include:
- Jeffrey S. Russell, PhD, PE, Chair, CAP³, russell@engr.wisc.edu.
 - Thomas A. Lenox, PhD, ASCE Staff Contact Member to CAP³, tlenox@asce.org.

* Within the context of this document, “ABET/EAC accredited” degrees refer to engineering degree programs accredited by the Engineering Accreditation Commission of ABET, Inc. – and programs considered to be equivalent. Typically, equivalent programs have included “Washington Accord” programs, “Substantially Equivalent” programs, and ECEI-assessed individual transcripts. Please see <http://www.abet.org> for more information.