



# Task force explores alternatives to “master’s or equivalent” requirement for engineering licensure

**T**he Engineering Education Task Force was formed in 2007 (as the Bachelor’s Plus 30 Task Force) to address the additional education requirement for initial engineering licensure. One of its charges in 2009–10 is to consider alternatives to the 2020 education requirement—a master’s degree in engineering or equivalent—as set forth in the NCEES *Model Law*.

As in previous years, the task force represents a wide range of views. It includes NCEES members, a consultant from ABET, and resource members from the following

Ultimately, the task force agreed that permitting the additional educational requirements to be satisfied by structured mentoring combined with education and experience in this manner is very different from the other pathways to licensure and needs much more study to determine its feasibility.

societies: American Council of Engineering Companies; American Institute of Chemical Engineers; American Society of Civil Engineers; American Society for Engineering Education; American Society of Mechanical Engineers; American Society of Heating, Refrigerating, and Air-Conditioning Engineers; IEEE–USA; and National Society of Professional Engineers.

At its December meeting, the task force agreed to focus on two alternatives. It developed them further at its January meeting and plans to present two related motions at the Annual Meeting.

### Alternative 1

The first alternative is to enable candidates earning a B.S. degree from an ABET-accredited bachelor’s program that requires a minimum of 150 credit hours to become licensed. To be eligible, the program must have at least 115 credit hours of math, science, and engineering, with at least 75 of the 115 hours in engineering. The rationale for accepting a program that meets these requirements is that the additional education initiative started as a result of an argument that there is an increasing number of bachelor degree programs that don’t provide what is needed for initial licensure. A bachelor’s program with these qualifications is more likely to provide the needed body of knowledge, so it should be accepted in fulfillment of the additional education requirement.

After discussing the pros and cons, the task force agreed that it will present a motion at the Annual Meeting for the Committee on Uniform Procedures and Legislative Guidelines (UPLG) to be charged with proposing an amendment to the *Model Law* to incorporate language for a program that meets these requirements to be added as a pathway to licensure after 2020.

### Alternative 2

The second alternative the task force discussed is one in which a candidate would earn a B.S. degree from an ABET-accredited program and then complete a prescribed number of technical development units and six years of experience with structured mentoring. Those in favor of

$$\Pi_3 : M^0 L^0 T^0 = (LT^{-2})^i (ML^{-3})^j (L^2)^k M^1$$

$$M^0 L^0 T^0 = M^{j+1} L^{i-3j+2k} T^{-2i}$$

this alternative argued that it offers flexibility for the candidate, recognizes the B.S. degree as the degree needed to be an engineer (when combined with experience), formalizes the training and experience aspect of licensure, reinforces the concept of lifelong learning, and starts lifelong learning early in the licensure process. Those opposed to this alternative were concerned about ensuring that the education is of sufficient rigor and at the level expected;

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## Proposed motion

Recognizing the need to develop knowledge, skills, and attitudes beyond the baccalaureate and before licensure, and recognizing that significant learning can occur outside the classroom, the following is proposed as an alternate pathway to licensure.

Upon graduating with an EAC/ABET B.S. degree in engineering, the applicant, during a 6-year period of progressive engineering experience before taking the PE exam, would be required to:

- Take courses totaling X (task force discussed 30) Assessed Learning Days (ALD) of continuing education in areas germane to professional practice and that support and enhance capability in the applicant's technical area of practice.
- Participate in a structured mentoring program amounting to at least 36 hours/year of interaction with a licensed P.E. mentor in the 3 years prior to application to sit for the principles and practice exam. The mentoring interaction is to be documented in a mentoring logbook that becomes part of the applicant's dossier. The mentoring program shall be structured to provide assurance that the individual has attained the appropriate body of knowledge for professional practice necessary for the individual's engineering discipline or practice area.

For the additional coursework, either credit or noncredit courses will be accepted, but the applicant would be required to demonstrate successful completion and that the content of the coursework was of sufficient content and rigor to meet the above requirements. Acceptable demonstration of content and rigor would include: (1) university courses; (2) continuing education courses offering ALDs (or equivalent credit units but not amounting to less than 1 ALD); (3) industrial in-house specialty courses designated as acceptable by the candidate's mentor; and (4) other courses meeting accreditation standards of nationally recognized authorities (including NCEES).

For the mentoring program, the applicant would be required to meet with and document structured mentoring hours with one or more senior P.E.s in his/her firm or P.E.s practicing in the applicant's desired area of practice. Alternately, the candidate can participate in a mentoring program offered by his/her technical or professional society.

## Additional education timeline

This year's Engineering Education Task Force continues almost a decade of NCEES focus on education requirements for engineering licensure. Below is a short timeline. For more in-depth history, go online to [ncees.org/about\\_ncees.php](http://ncees.org/about_ncees.php).

**2001:** Engineering Licensure Qualifications Task Force established

**2003:** ELQTF presents findings to Council; Licensure Qualifications Oversight Group established

**2004:** LQOG reports to Council

**2005:** Council begins process of changing *Model Law*

**2006:** Council votes to add language to *Model Law/Rules* requiring a master's or equivalent for licensure

**2007:** Council votes to uphold the additional education requirement

**2008:** Bachelor's Plus 30 Task Force established; Council approves *Model Rules* definitions of acceptable coursework and approved course providers; Council passes resolution to explore other alternatives

**2009:** Engineering Education Task Force develops response to resolution, clearinghouse, and white paper

**2010:** Engineering Education Task Force charged with considering alternatives to education requirement

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$$110,288 - 27,712$$

$$\frac{ka}{m} \ln^2 \left( \frac{m}{s} \right)^2$$

*Should the FE or PE exams be waived for particular candidates?*

There are circumstances in which waiving the FE exam is warranted for comity applicants (for example, for long-established practice). The PE exam should not be waived.

### Identifying best practices

The committee recommends the following for best practice when evaluating initial or comity licensure applications:

- To share information on disciplinary matters, boards should send adjoining jurisdictions a certified copy of the consent order.
- Boards should make background checks with a law enforcement database such as Westlaw, LexisNexis, or the state police, as well as the NCEES Enforcement Exchange database.
- Boards should work toward receiving applications, supporting documents, and fees electronically.

- Boards should work toward using model applications and supporting documentation forms.
- MBAs should update the Member Board survey information on a quarterly basis.

Looking forward, the committee hopes to continue next year and begin developing common forms for those jurisdictions that wish to use them, including models of the following:

- Application form
- Verification of experience/reference form
- Exam/licensure verification form
- Code of ethics exam, which will be required of all applicants

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how achievement of the learning outcomes would be assessed; and whether the mentoring would be consistent and verifiable, and would actually achieve the minimal expectations in all cases.

Courses such as one-week intensive industry courses could count toward the educational requirement, while continuing education courses as they mostly are today (not necessarily with rigor and assessment) would not. The task force created a new term—assessed learning days—to describe this coursework and to highlight that these educational experiences are different from college courses and continuing education courses.

Ultimately, the task force agreed that permitting the additional educational requirements to be satisfied by structured mentoring combined with education and experience in this manner is very different from the other pathways to licensure and needs much more study to determine its feasibility. As such, the task force will present a motion to charge the appropriate committee to further studying this concept.