

UPLG continues mission to strengthen education requirements

At last year's Annual Meeting, the Council voted to require education beyond a bachelor's degree as a future requirement for engineering licensure. This year, the Committee on Uniform Procedures and Legislative Guidelines has been charged with proposing what that education should be. The committee's work will result in several motions to be presented at the Annual Meeting. Here are the answers to several questions related to the UPLG Committee's ongoing activities.

What has happened in the past few years to lead to the UPLG Committee's current activities?

The process began in 2001 with the creation of the Engineering Licensure Qualifications Task Force (ELQTF)—a group made up of representatives from NCEES as well as private practice, government, industry, and academia. ELQTF spent several years evaluating the licensure system in the United States. Its work included an evaluation of engineering education that pointed out “a persistent decrease in the credit hours required for an engineering degree” resulting in “a net national loss in the depth of engineering education in core subjects.”

The ELQTF report coincided with two publications echoing its conclusions: *The Engineer of 2020: Visions of Engineering in the New Century*, published by the National Academy of Engineering, and *The Civil Engineering Body of Knowledge for the 21st Century*, published by the American Society of Civil Engineers. The National Academy of Engineering report expressed a need for future engineers to keep pace with “a bewildering array of new technologies” in an increasingly interconnected world. Pointing to a steady decline over several decades of required credit hours for engineering bachelor's degrees from an average of 150 to 128, the ASCE publication noted that coursework is increasingly being devoted to fulfilling degree requirements in subject areas that were both nontechnical in nature and not directly applicable to the practice of engineering.

The ELQTF findings led to the creation of the Licensure Qualifications Oversight Group (LQOG), which was made up of Council members who researched the education issue while gathering opinions and information from the Member Boards. Delegates at the 2005 Annual Meeting passed a motion presented by LQOG to charge the UPLG Committee with proposing revisions to the *Model Law* to require 30 credit hours in addition to a bachelor's degree as a prerequisite for engineering licensure.

In 2006, the UPLG Committee presented a motion to add language to the *Model Law* stating that beginning in 2015 engineer interns must have 30 credit hours in addition to the bachelor's degree in order to sit for the Principles and Practice of Engineering (PE) exam. This year, the UPLG Committee has been charged with further clarifying these new requirements.

How do the current UPLG charges relate to last year's addition of the “bachelor's degree plus 30” requirement for licensure?

Of the seven charges assigned to the UPLG Committee for 2006–07, two deal specifically with clarifying the new *Model Law* language strengthening the education requirements for engineering licensure. The first charge asks the committee to incorporate definitions for “acceptable coursework” and “approved course providers” into the *Model Rules*, while the second charge asks the committee to integrate the newly adopted education requirements into the definitions of Model Law Engineer and Model Law Structural Engineer.

In response to the first charge, the UPLG Committee has composed language for Section 230.15 of the *Model Rules* (see box on page 15) defining the terms “acceptable upper-level undergraduate or graduate level coursework” and “approved course providers.”



Howard C. Harclerode II, P.E.
Chair, UPLG Committee



Michael J. Conzett, P.E.
Subcommittee Chair,
UPLG Committee

According to the proposed language, what types of courses would be acceptable for fulfilling the new education requirements?

The new language divides the coursework required for the plus-30 requirement into two categories: technical and professional practice. This division reflects the committee's belief that the new education requirements must add to the depth and breadth of a candidate's body of knowledge.

Of the 30 additional credit hours, Section 230.15 B states that 20 or more of the credit hours must come from technical courses in engineering, mathematics, and the hard sciences, while the remaining 10 would be from professional-practice coursework. The committee proposes this 2:1 ratio of technical to professional-practice credit hours because many technical courses that were once required for undergraduate engineering degrees are no longer required and instead are offered as electives or in graduate degree programs. The new language also requires that, of the 20 hours of technical coursework, at least 10 must come from graduate-level courses.

Some of the reasoning behind this emphasis on technical education relates to the fact that many engineering employers now are finding it necessary to provide significant technical education to engineering graduates during their time as engineer interns. As the required body of knowledge becomes more complex and specialized, the need for these employers to educate their employees in technical subjects becomes greater. Finally, because employers approach this education in different ways, PE exam candidates have widely varying levels of understanding with regard to technical subject matter. By adopting the proposed technical education requirements into the *Model Rules*, all candidates for professional engineering licensure would be better equipped with the knowledge required to pass the PE exam.

In the professional-practice category, the committee's proposed *Model Rules* language stipulates in Section 230.15 A.2 that the coursework be "related to skills directly relevant to the individual's practice." It would include coursework in subjects such as communications, ethics, contract law, project management, and public policy. The types of courses listed in 230.15 A.2 should not be interpreted as an all-encompassing, exhaustive list. The proper courses to take to fulfill the

professional-practice category requirements would in large part depend on the candidate's engineering discipline and the body of knowledge necessary to possess minimum competency in that discipline.

What types of institutions will be accepted by the Council as approved course providers for credits fulfilling the new education requirements?

The proposed language also indicates, in Section 230.15 A, that acceptable coursework must come from institutions that have at least one program of study accredited by EAC/ABET, or, if not, that the courses be "equivalent in intellectual rigor and learning assessment" to such courses in EAC/ABET-accredited programs. The benchmark of EAC/ABET accreditation is used to help ensure a high level of quality in the coursework. Section 230.15 C of the proposed language further defines an approved course provider as either an institution offering EAC/ABET-accredited programs or an organization offering courses accredited by an alternative, NCEES-approved accrediting body.

Who would decide whether a course is equivalent to one that would be offered by an academic institution with an EAC/ABET-accredited program?

In its definition of *approved course providers*, the UPLG Committee has taken into account the fact that a wide variety of organizations will be interested in and capable of providing the coursework needed to fulfill the technical and professional education requirements. The "alternative, NCEES-approved accrediting body" as such does not currently exist. However, the committee believes that such an accrediting entity may be created out of necessity in the future. The criteria for evaluating the classes that would be offered by such organizations should be a future charge for the UPLG Committee in the coming year.

How does the UPLG Committee propose to define the Model Law Engineer and Model Law Structural Engineer in light of last year's adoption of the "bachelor's degree plus 30 credits" requirement?

The UPLG Committee's second motion is to incorporate the plus-30 language into the *Model Rules* definitions of Model Law Engineer and Model Law Structural Engineer found in Section 210.20. The new language is found in 210.20 B.2 and 210.20 B.4, and is listed below the current definitions remaining in effect until 2015.

As of January 1, 2015, both the Model Law Engineer and Model Law Structural Engineer will have graduated from an engineering program accredited by EAC/ABET and will have completed an additional 30 credit hours of acceptable upper-level undergraduate or graduate coursework from approved course providers. These definitions are compatible with the requirements for “Licensure by Examination” now included in *Model Law* 130.10 C.1.

Does the UPLG Committee have any other recommendations related to the passage of either of these motions?

If the first motion passes, the UPLG Committee recommends that the appropriate committee be charged with reviewing *Model Rules* Section 230.40 dealing with examinations. The language, which the Council passed at last

year’s Annual Meeting, states that, beginning in 2015, a graduate with a bachelor’s degree requiring more than 120 credit hours may request that credits earned in excess of 120 be applied to satisfy the plus-30 requirements.

UPLG’s proposed language originally stated “from a five-year program” rather than “in excess of 120 credit hours,” but it was amended from the floor. If this year’s Motion 1 passes, this language would contradict the new language defining acceptable credits.

*Howard “Skip” C. Harclerode II, P.E.
Chair, UPLG Committee*

*Michael J. Conzett, P.E.
Subcommittee Chair, UPLG Committee*

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New language for Model Rules

At this year’s Annual Meeting, UPLG will propose adding the following language to Section 230.15 of the *Model Rules*, defining “acceptable coursework” and “approved course providers” for the new bachelor’s plus-30 education requirements:

- A. The term “acceptable upper-level undergraduate or graduate-level coursework” used in Section 130.10 C.1.c of the *Model Law* is interpreted to mean the following:
 1. In technical topic areas, acceptable coursework shall be
 - a. A combination of upper-level undergraduate and graduate-level courses or all graduate-level courses in engineering, sciences, or mathematics at institutions that have a program or programs accredited by EAC/ABET; and/or
 - b. Such courses that are equivalent in intellectual rigor and learning assessment to upper-level undergraduate and/or graduate-level courses offered at institutions that have a program or programs accredited by EAC/ABET.
 2. In professional practice topic areas, acceptable coursework shall be courses related to skills directly relevant to the individual’s practice, including but not limited to the following: communications, contract law, economics, engineering management, ethics, finance, institutional management, physical asset management, project management, public policy, and quality management. Such courses shall be equivalent in intellectual rigor and learning assessment to upper-level undergraduate and/or graduate courses offered at institutions that have a program or programs accredited by EAC/ABET.
- B. At least 20 of the 30 credits shall consist of coursework as defined in 230.15 A.1 above. At least 10 credits of the coursework in the technical topic area shall be graduate-level coursework.
- C. The term “approved course provider” used in Section 130.10 C.1.c in the *Model Law* is interpreted to mean an institution or organization that offers courses meeting the definitions of acceptable coursework in Section 230.15 A.1 and/or Section 230.15 A.2 as defined above. Such institutions shall offer EAC/ABET-accredited programs. Such organizations shall offer courses accredited by an alternative NCEES-approved accrediting body.
- D. The term “credit” as used above is defined as 1 semester hour or its equivalent.