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FEANI Statement on Bologna and Prague Declarations

FEANI supports the Bologna and Prague Declarations as steps towards achieving greater commonality of content in European engineering degrees and facilitating the mobility of European engineering students.

- FEANI will liaise with all parties concerned: governments, universities, professional organisations, etc. to help promote implementation of the principles contained in the two declarations, taking into account the diversity of educational systems that exist within the member states of the European Union, the need to harmonise the implementation of such principles and rationalisation of the formation process for professional European engineers.
- FEANI will consult the European Commission on all recommendations it might have to formulate in this respect, and work to achieve agreement.
- FEANI recommends that the existing European system of longer integrated engineering curricula leading straight to a Master's Degree should be maintained in parallel with a two-cycle Bachelor/Master system.
- FEANI has already introduced the basic principles of Bologna into its Register and Index relating to EUR ING, and has addressed issues such as lifelong learning and cooperation in degree accreditation as recommended in the Prague Declaration.

ACADEMIC PREREQUISITES FOR LICENSURE AND PROFESSIONAL PRACTICE

ASCE Policy Statement 465

Approved by the Committee on Academic Prerequisites for Professional Practice on February 15, 2007

Approved by the Policy Review Committee on March 9, 2007

Adopted by the Board of Direction on April 24, 2007

Policy

The American Society of Civil Engineers (ASCE) supports the attainment of a Body of Knowledge (BOK) for entry into the practice of civil engineering at the professional level. This would be accomplished through the adoption of appropriate engineering education and experience requirements as a prerequisite for licensure.

ASCE encourages institutions of higher education, governmental units, employers, civil engineers, and other appropriate organizations to endorse, support, promote, and implement the attainment of the Body of Knowledge for individual civil engineers. The Body of Knowledge includes (1) the fundamentals of math, science, and engineering science, (2) technical breadth, (3) breadth in the humanities and social sciences, (4) professional practice breadth, and (5) technical depth or specialization. Fulfillment of the Body of Knowledge requires additional education beyond the bachelor's degree for the practice of civil engineering at the professional level. The implementation of this effort should occur through establishing appropriate curricula in the formal education process, appropriate experience guidelines for the workplace, and related education and experience standards **by the 55 engineering licensure jurisdictions.**

Admission to the practice of civil engineering at the professional level means professional engineering licensure requiring attainment of a Body of Knowledge through appropriate engineering education, experience and examinations. Fulfillment of this Body of Knowledge will typically include a combination of:

- a baccalaureate degree in civil engineering,
- a master's degree, or approximately 30 coordinated graduate or upper level undergraduate technical and/or professional practice credits or the equivalent agency/organization/professional society courses providing equal academic quality and rigor, and
- appropriate experience based upon broad technical and professional practice guidelines which provide sufficient flexibility for a wide range of roles in engineering practice.

Issue

The practice of civil engineering at the professional level means practice as a licensed professional engineer.

The Body of Knowledge prescribes the necessary depth and breadth of knowledge, skills, and attitudes required of an individual entering the practice of civil engineering at the professional level in the 21st Century. This Body of Knowledge exceeds today's typical civil engineering baccalaureate degree, even when coupled with the practical experience gained prior to licensure.

The civil engineering profession is undergoing significant, rapid, and revolutionary changes that have increased the Body of Knowledge required of the profession. These changes include the following:

- Globalization has transcended the historically recognized worldwide geographic boundaries primarily as a result of enhanced communication systems.
- Information technology continues to make more information available; however, the analysis and application of this information is becoming more challenging.
- Complex systems are requiring integration of our knowledge and skills outside of traditional sub-discipline focus.
- The diversity of society is challenging our traditional views and increasing our need for improved interpersonal and communications skills.
- Many clients are searching for leadership in new management approaches that equitably manage risk as well as improve cost, quality and safety performance.
- New technologies in engineering and construction are emerging at an accelerating rate
- Enhanced public awareness of technical issues is creating more informed inquiry by the public of the technical, environmental, societal, political, legal, aesthetic, and financial implications of engineering projects.
- Civil infrastructure support within the United States is rapidly changing from a focus on development and operation, to the innovative renewal, maintenance, and improvement of existing systems, and the visionary development of new systems.

These changes have created a need for civil engineers to have simultaneously greater breadth of capability and specialized technical competence than that required of previous generations. For example, many civil engineers must increasingly assume a different primary role from that of designer to that of program, project or team leader. The knowledge required to support this new need is found in the combination of an appropriate baccalaureate education, additional education, and experience.

Rationale

Requiring education beyond the baccalaureate degree for the practice of civil engineering at the professional level is consistent with other learned professions. The Body of Knowledge gained in the formal civil engineering education process is not significantly less than the comparable knowledge and skills required in other professions. It is unreasonable to believe in such complex and rapidly changing times that we can impart the specialized Body of Knowledge required of professional engineers in just four years of formal schooling while other learned professions necessitate seven or eight years. Four years of formal schooling were considered the standard for medical, law and engineering professionals 100 years ago. While the education requirements for physicians and attorneys have been increased with the growing demands of their respective professions, the requirements for the practice of engineering have remained virtually unchanged. Today, many other professions beyond medicine and law require education beyond the baccalaureate degree including pharmacy, architecture, occupational therapy and accounting. Most likely, the retention of a four-year undergraduate engineering education has contributed to the lowered esteem of engineering in the eyes of society, and prospective students and the commensurate decline in the perceived value brought forth by engineers relative to other professions.

Current baccalaureate programs, while constantly undergoing reform, still retain a nominal four-year education process. This length of time limits the ability of these programs to provide a formal education consistent with the increasing demands of the practice of civil engineering at the professional level. There are diametrically opposed forces trying to squeeze more content into the baccalaureate curriculum while at the same time reducing the credit hours necessary for the baccalaureate degree. The result is a baccalaureate civil engineering degree satisfactory for an entry-level position, but becoming inadequate for the professional practice of civil engineering. The four-year internship period (engineer-intern) after receipt of the baccalaureate degree cannot make up for the formal educational material i.e. the expanded Body of Knowledge that would be gained from additional education.

The implementation of this concept will not happen overnight. While ASCE cannot mandate that it be done in a specified time period or manner, ASCE will be an active partner with other groups and organizations to accomplish this policy. The ultimate full implementation may not occur for 5 to 15 or more years. Appropriate grandfathering for existing registered and degreed engineers will be part of the implementation process. This concept is a legacy for future generations of civil engineers. However, perhaps the most important aspect of the implementation of this policy is already in place. Within the U.S. system of higher education, high quality, innovative and diverse master's degree programs currently exist in colleges and universities to support this concept. A growing number of government agencies, public and private organizations, and professional societies now offer high quality on-site and distance learning educational opportunities that can support attainment of the Body of Knowledge outside of college campuses and as adjuncts to employee

development. The active support of this policy by all of the stakeholders such as the educational institutions, the registration boards, and the various employers of civil engineers will be required for the implementation of this concept.