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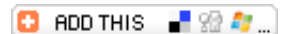
### Software Engineering PE Examination Development Approved

BY MITCHELL THORNTON

At its recent meeting in Louisville, Ky., the NCEES Board of Directors approved moving forward with the development of a Principles and Practice of Engineering examination, commonly known as the PE exam, for the discipline of software engineering. NCEES is an organization composed of all engineering and surveying licensing boards in the United States and several territories. NCEES develops, scores, and, for many states, administers examinations used for engineering licensure, including the current electrical and computer engineering PE examinations. As part of the NCEES board action, it was agreed that IEEE-USA will serve as the lead technical society sponsoring the examination with cooperative agreements from other organizations, including the IEEE Computer Society and the National Society of Professional Engineers. The board action came on 11 August 2009, when a motion to begin the development of the examination was approved.

The new software engineering PE examination will not be part of the currently existing electrical and computer engineering PE examination and should not be confused with the current computer engineering module of that exam. Although the exact specifications of the new software engineering PE examination will be finalized in coming months, a study performed by the IEEE-USA Licensure and Registration Committee reports that the amount of examination knowledge content overlap among the existing computer engineering PE examination and the new software engineering examination will likely be at most 20 percent. This is due to the fact that the existing computer engineering examination contains a significant amount of content related to hardware and data communications networking material.

The prerequisite for NCEES to consider initiating a PE examination in a new discipline includes written requests from no fewer than 10 state licensing boards that can



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demonstrate a need for the examination in their jurisdictions. The requests must include proof of such need, estimate of usage, and evidence that knowledge areas and skills are not adequately measured in an existing examination. In addition, no new discipline can be added to the examination program unless there is an Engineering Accreditation Commission (EAC)/ABET-accredited program in that discipline. IEEE-USA agreed to serve as the lead technical society sponsoring the new examination and its role will include the coordination and support of volunteers to participate in the development of the examination in cooperation with other interested organizations including the IEEE Computer Society. The jurisdictional licensing boards requesting the examination were those with significant amounts of software engineering industry and those that have institutions granting EAC/ABET-accredited degrees in software engineering. ABET is the accrediting agency for all engineering and technology programs in the United States, and the EAC is responsible for engineering programs in particular.

Professional licensure for an engineering discipline is established by each U.S. jurisdiction at their discretion; however, NCEES has an existing “model law” recommendation that requires: 1) a four-year EAC/ABET-accredited degree in an appropriate engineering discipline, 2) successful completion of an eight-hour fundamentals of engineering examination, 3) verifiable and documented evidence of four years of qualifying engineering experience, and 4) completion of an eight-hour Principles and Practice of Engineering examination. Over the past decade there have been several efforts to establish a path to professional practice licensure for software engineers. These efforts have not been successful due to a variety of issues; however, one of the primary reasons has been the lack of infrastructure to support licensure in accordance with NCEES model law. Specifically, the absence of a reasonable number of EAC/ABET-accredited programs offering an undergraduate degree in software engineering posed a significant impediment. According to the ABET Web site [[abet.org](http://abet.org)], as of 1 August 2009, there are 17 EAC/ABET-accredited software engineering programs in the United States. Therefore, the only remaining need to establish software engineering licensure is the creation and administration of a software engineering PE examination.

In a report from the IEEE-USA Licensure and Registration committee, it was noted that software engineering professional licensure affects both U.S. IEEE members and society at large. The central issue is one of *protection of public safety, health and welfare*, since the purpose of licensure is to establish competence to practice in an area and not to measure the level of an individual's expertise above the competency threshold. A large number of technologies in existence and development today are directly impacted by software engineering, including safety critical artifacts such as real-time controllers and logistics systems. Additionally, software engineering licensure offers practicing IEEE members in the United States a credential that is available to virtually all other engineering disciplines, ranging from mainstream electrical, civil, mechanical and chemical disciplines to smaller populated disciplines such as control systems, fire protection, nuclear and naval engineering.

In 2007, the Software Engineering Licensure Consortium (SELC) — a group of organizations with interest in establishing a path to licensure for software engineers — was established. SELC consists of the Texas Board of Professional Engineers, IEEE-USA, the IEEE Computer Society, the National Society of Professional Engineers (NSPE) and several jurisdictional licensing boards. Early on, this group developed a software engineering licensure needs document that was distributed to licensing boards. It also conducted a U.S. IEEE member survey to determine need and interest in establishing a software engineering licensure path. The survey was prepared by SELC and administered by the IEEE Computer Society with support from IEEE Corporate Research. The survey consisted of five questions and was sent to 10 percent of the approximately 35,000 U.S. IEEE members who indicated they practice software engineering professionally as of late 2008. The survey was concluded in approximately two weeks with a 22 percent response rate. The majority of respondents indicated they were in support of licensing software engineers. Based on the survey results and the response of the jurisdictional boards (after receiving the document outlining the need for software engineering licensure), the SELC began coordinating the collection of licensure board letters of support, and assisted in obtaining agreement for the designation of IEEE-USA as the lead technical organization. These efforts culminated in the recent NCEES Board of Directors decision to authorize the development of the PE examination for software engineering licensure.

The next phase of the examination development activity will involve undertaking a process known as a Professional Activities and Knowledge Study (PAKS). The PAKS process will include the development of surveys and meetings with licensed engineers who practice software engineering that will ultimately result in a specification of the content for the software engineering licensure examination. Once the specification is developed, IEEE-USA and the IEEE Computer Society will coordinate formation of a committee of software engineers to develop examination questions under the oversight of NCEES. After NCEES receives the committee's software engineering PE examination, it will be each individual licensing board's decision as to whether they will license software engineers in their state or territory. The existence of the software engineering PE examination will serve to enable each board to make such a decision based on the needs of their individual jurisdictions.

U.S. IEEE members wishing to participate in the software engineering PE examination development effort can volunteer by filling out the online form located at the NCEES Web site [[www.ncees.org/volunteer.php](http://www.ncees.org/volunteer.php)].

To learn more about licensure and registration, see:

- IEEE-USA's Licensure and Registration Committee  
[[www.ieeeusa.org/volunteers/committees/lrc/](http://www.ieeeusa.org/volunteers/committees/lrc/)]
- The National Society of Professional Engineers (NSPE)  
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- NCEES  
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