Initiating an Undergraduate Program in Software Engineering

Bradley D. Carter
Mississippi State University
carter@cs.msstate.edu

With the action by ABET to accredit undergraduate programs in software engineering, it is expected that many engineering schools in the U.S. will soon initiate such programs. The job market in computing continues to grow and there is much evidence of a demand for graduates who understand how to "engineer" software systems and products. From an international perspective, the U.S. is lagging behind many other Western and Pacific Rim countries in software engineering education. The action by ABET should help the U.S. "catch up."

ABET has outlined general requirements for accreditation, but the details and depths of the topics specified are not yet well understood. Only after software engineering programs begin to be accredited and after there is better organization of the software engineering education community will a consensus evolve. In the meantime, engineering schools that initiate software engineering programs can do so by following the "general" ABET guidelines and "reusing" much of the existing computer science and engineering curricula complimented by a few strategically selected new courses. The software engineering programs can be managed by existing computer science or computer engineering departments to alleviate costly administrative overhead and to reduce perceived "competition." In fact, it is very beneficial if these three programs (computer science, computer engineering, and software engineering) are closely aligned.

Mississippi State University has proposed an undergraduate software engineering program to be managed within the College of Engineering by the Department of Computer Science in partnership with the Department of Industrial Engineering. It relies heavily on existing computer science, computer engineering, and industrial engineering courses, with the initial addition of only two new software engineering courses and a senior laboratory. Computer science and computer engineering courses in the program address the study of core computer science, of computer technology, of fundamentals of software engineering and software process, of software design and testing, and of information security. Industrial engineering courses include engineering statistics, engineering economy, project management, process improvement, and engineering administration. Certainly other courses will be added over time, but MSU faculty believe the proposed curriculum satisfies ABET requirements and begins the program with a solid academic foundation that will be attractive to prospective employers. The proposal for the program will be considered by the Mississippi Board of Trustees for Fall 2000 implementation.

The presentation overviews the program requirements and the curriculum and discusses the rationale for curriculum design and decisions.