

Generating Undergraduate Software Engineering Courses/Programs Using the Computing Curricula Software Engineering Volume

Richard LeBlanc
Georgia Tech
801 Atlantic Drive
Atlanta GA 30332-0280
rich@cc.gatech.edu

Tim Lethbridge
Univ. of Ottawa
800 King Edward Ave.
Ottawa, Ontario,
Canada, K1N 6N5
tcl@site.uottawa.ca

Ann E.K. Sobel
Miami University
230 J Kreger Hall
Oxford, OH 45056
sobel@muohio.edu

1. Background of Workshop

The Software Engineering Volume is part of the IEEE-CS/ACM Computing Curricula effort that began in the fall of 1998 when a group of dedicated individuals from the IEEE Computer Society and the ACM were appointed by the two societies to begin work on what was then called Computing Curriculum 2001. This Steering Committee came to the conclusion that the area of computing had gone beyond the boundaries of computer science and that one volume would not effectively contain all of the newer areas of computing that had been developed. It was decided to split the Computing Curriculum effort into several volumes: namely, Computer Science, Computer Engineering, Software Engineering, and Information Systems volumes. The main goals of the IEEE-CS/ACM Computing Curricula effort are to provide guidance to academic institutions and accreditation agencies about what should constitute an undergraduate education in one of the aforementioned areas.

Foundation work for the Software Engineering Volume began in 1998 with the Software Engineering Education Project (SWEEP) which produced a draft set of accreditation guidelines for software engineering published in IEEE Computer, April 1999 issue. In the fall of 2001, SWEEP was replaced by the Steering Committee for the Computing Curricula Software Engineering Volume (CCSE). Starting in the fall of 2001, the CCSE development process has proceeded in two distinct, overlapping stages: specifying the core knowledge and preparing curriculum guidelines. The Education Knowledge Area group was responsible for defining and documenting a software engineering body of knowledge appropriate for guiding the development of undergraduate software engineering curricula. The Pedagogy Focus group was responsible for using the software engineering education knowledge to formulate guidance for pedagogy, and course and curriculum design to support undergraduate software engineering degree programs. Their work embodies the two main components of the CCSE: the undergraduate software engineering education knowledge (SEEK) which defines what every graduate of a software engineering program should know and a variety of curriculum models that demonstrate how this material can be organized in the design of software programs for various institutional environments. The first draft of CCSE was available in June of 2003 and has undergone a lengthy external review. The first release of the Volume will occur after both an expert and external review of the upcoming second draft.

2. Goal of the Workshop

As scheduled in the process plan for the CCSE Steering Committee, the first release of the Volume will occur in early 2004. Therefore, the Steering Committee is shifting its focus to the actual use of the Volume by assisting academicians in applying the recommended curriculum models to their particular institutional environments. The development of the curriculum models presented in the Volume was supported by the use of a curriculum model template implemented using an Excel spreadsheet. This template supports curriculum customization work by providing an analysis of a curriculum design to determine the

completeness of its coverage of subject materials defined in the SEEK. A tool currently under construction will provide a combination of the spreadsheet with the completeness check to the subjects in the SEEK and a more user-friendly interface. This tool will greatly support the design of undergraduate software engineering programs for specialized environments. The goal of the workshop is to provide hands-on assistance to participants in using this tool to customize the CCSE's curriculum recommendations.

3. Planned Workshop Format

The objectives set for this workshop are:

1. To inform attendees of the developmental stages of the volume and the factors that were taken into account during this development.
2. To familiarize attendees with the content of the volume and outline its use in the development of SE programs.
3. To assist attendees in their use of the volume either to develop new SE courses/programs or in adapting existing ones.
4. To provide hands-on assistance in using a software tool that has been developed to assist in the customization of the CCSE's curriculum recommendations

Initially, an overview of the CCSE Volume, its significance, and its intended purpose will be presented. The presented material will include details of the curriculum model template and how it was used to develop a variety of undergraduate software engineering programs from around the world. While this material is delivered, workshop participants will be asked to fill out a survey determining their particular degree program structure and constraints of their institutional environment.

The solicited information will be used to place participants from similar environments in working groups. A workshop organizer will assist each group with using our curriculum mapping tool to customize our curriculum recommendations for their environments. Each group member will benefit from participating in the tradeoffs that must be made to design a curriculum for each specialized environment. A representative curriculum design and the constraints of the institutional environment from each working group will be presented to all participants.

Each participant of the workshop will take from it specific implementation guidance on either a portion of or an entire program in undergraduate software engineering that is adapted for the circumstances of their particular institution.