In 1998, the Association for Computing Machinery (ACM) and the Computer Society of the Institute for Electrical and Electronic Engineers (IEEE-CS) convened a joint curriculum task force called Computing Curricula 2001, or CC2001 for short. The CC2001 Task Force was asked to develop a set of curricular guidelines that would “match the latest developments of computing technologies in the past decade and endure through the next decade.” Over the past fifty years, computing has become an extremely broad designation that extends well beyond the boundaries of computer science to encompass many independent disciplines, including computer engineering, software engineering, information systems, and many others. The final CC-2001 report is planned to be organized into five volumes: Volume I: Overview, Volume II: Computer Science, Volume III: Computer Engineering, Volume IV: Software Engineering, Volume V: Information Systems. The primary focus of this panel is the Computer Engineering volume. A committee has been established in the beginning of 2001 to define the body of knowledge that constitutes computer engineering as well as to flesh out course outlines to suit different curricula in computer engineering.

Computer Engineering embodies the science and the technology of design, construction, implementation and maintenance of the hardware and the software components of modern computing systems and computer-controlled equipments. Computer Engineers are solidly grounded in the theories and principles of computing, mathematics and engineering, apply these theoretical principles to design hardware, software, networks, and computerized equipments and instruments to solve technical problems in diverse application domains. Continuing dramatic advances in computing and digital systems design have created opportunities for computer engineering professionals to apply those developments to the entire range of applications in engineering. Over the past three decades the discipline of computer engineering has emerged from the erstwhile fields of electrical engineering and computer science as a separate, although intimately related, discipline. The development of a successful computer-engineering curriculum requires an understanding of the unique nature of this discipline. Computer Engineering focuses on the design of computing elements and computer based systems; it integrates hardware and software and provides human systems interfaces to produce efficient cost-effective total systems to solve technical problems in diverse application domains. Computer Engineering programs require a strong foundational component in science and mathematics and emphasize on design and creativity with strong laboratory experience throughout the program using modern laboratory environments and industry standard design and maintenance tools.

The work is well in progress. Most of the Body of Knowledge has been created – BOK has been organized hierarchically into three levels: disciplinary sub fields (e.g. Digital Logic), units or thematic modules within an area (e.g., Switching Theory) and topics (lowest hierarchical level within a unit (e.g. Number Systems). Units are designated “core” (to be covered in all computer engineering programs) and “elective” (inclusion depends on program objectives). The committee has also developed a list of principles that will guide the entire curriculum development process and plan to provide guidelines on characteristics of graduates, role of professional practice, mathematics and science requirements and implementation issues. While there will be many ways to organize and present the material from the body of knowledge, the committee will provide information on successful implementation of courses.

The purpose of the present panel is to present an overview of the current status of the work in computer engineering curriculum development and to invite suggestions, comments and feedback from the participants. The expected interaction generated from the panel will go a long way to give the document its final shape. The panel will also serve to raise the awareness of the project among computer engineering educators and practitioners and motivate them to be involved in the on going process. It is to be noted that the committee on computer engineering will have nearly completed its work on the final draft of the document and we will present a nearly complete draft of the entire document containing the fundamental concepts, computer engineering special tracks as well as some implementation issues in terms of course design and curriculum design in the context of different universities and colleges.

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