A Model for a Computer Engineering Program
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Abstract - Even though ABET Criteria 2000 has not received widespread support among educators yet, the criteria fosters considerable flexibility, creativity and innovation in the design of curriculum. We present here a Computer Engineering Curriculum that not only satisfies ABET criteria in all respects, but also provides an excellent preparation for students to enter careers in computer field as entry-level engineers and/or to pursue graduate study.

The curriculum proposed here will encompass the necessary background in mathematics, basic sciences, and engineering topics. The general education content provides an excellent blend of liberal arts education. The courses and laboratories in computer engineering suggested here provide an excellent balance among computer theory, hardware and software design as well as analysis and synthesis techniques. Coverage of ethics and engineering communications is also emphasized.

The curriculum was designed by identifying the necessary ingredients of knowledge and execution skills that should be mastered by a student to be a productive engineer, and be able to continue learning through formal programs as well as continuing education. These topics are blended into courses and laboratory exercises that provide valuable, challenging and enjoyable experiences for the students. Analysis, synthesis and design of hardware and software systems are developed throughout the curriculum.

Several additional factors that influenced the redesign of our curriculum in addition to ABET criteria include:

1. an excellent opportunity to modernize our offerings,
2. a curriculum that is close to 120 Semester Hours,
3. integration of liberal arts core curriculum,
4. reinforcing communication skills and ethical considerations,
5. emphasizing safety, and team skills, and
6. impart ability to engage in lifelong learning

Our department was also fortunate to receive a National Science Foundation Infrastructure grant (NSF- CDA 95- 22265) and substantial commitment from the university to develop computer engineering courses and laboratories. The computer engineering faculty have committed to emphasize design experience in all our courses, even those without a formal laboratory using design automation tools at several levels of abstraction. After extensive discussion, we have identified several topics for inclusion in the curriculum. These topics include Finite Machine Theory; Logic Design; Finite Machine Synthesis; Logic Design Laboratory with simulation; Microprocessor-based design; Microprogrammed control; Design of sequential control; Computer design; cmos VLSI design; Algorithm implementation in hardware; PCB design; Design Automation; FPGA-based design; Timing, clocking and delay; Power distribution; Testing; Computer Architecture; Arithmetic algorithms; Assembly language programming; Data structures; Operating systems; Compilers; High-level language programming; Networks; Data Communication techniques and hardware. These topics and the other topics discussed before are packaged into an eight-semester curriculum. Some of the course materials are available on World Wide Web. Eventually all course materials will be disseminated in this manner.

References:

2. Peter M. Maurer, “ Enhancing the hardware design experience for computer engineers” this conference.