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Mechanical engineering curricula: a baseline study for the future effects of ABET EC2000

The Accreditation Board for Engineering and Technology (ABET) is recognized by the U.S. Department of Education as the sole agency responsible for accreditation of educational programs leading to degrees in engineering, engineering technology, and related engineering areas. Starting in 2001, engineering programs have been accredited under the new Engineering Criteria 2000 (EC2000). The philosophy of Engineering Criteria 2000 is to allow institutions and programs to define their mission and objectives to meet the needs of their constituents and enable program differentiation. Emphasis is placed on continuous improvement of programs based on the input of constituents and a process that links outcomes and assessment to program objectives.

Under this background and context, this research was a preliminary study of selected mechanical engineering programs to discern the impact of EC2000 on curriculum development. Data on the layout and composition of mechanical engineering curricula for nine schools in the United States with Ph.D. programs and nine schools without Ph.D. programs was presented. The schools chosen offered a wide geographic representation of the United States.

An earlier research study by Robert E. Mates influenced this work. Mates conducted a *Survey of Undergraduate ME Programs* in 1987 at the State University of New York at Buffalo.

To collect data to investigate this research question, the mechanical engineering curriculum for the selected schools was attained from the most recent information available at the respective school's web site on the Internet. Degree requirements were broken down into ten sub-areas for technical subjects and a lumped category of liberal arts and social science subjects.

The major findings and conclusions of this study revealed that, in general, undergraduate mechanical engineering programs are quite similar across the country. There was also no discernable difference between schools that offered Ph.D. programs and those that did not. While some schools offered more elective choices, the percentage breakdown of technical subject areas was relatively consistent across all programs.

Most interesting was the comparison of the current research with the survey from 1987. The results of these two studies were remarkably similar. Perhaps the only two small noticeable changes or trends over this thirteen year period was a slight increase in the percentage of design and manufacturing subjects in current curricula along with an increase in the percentage of liberal arts and social science subjects in current mechanical engineering programs. The increase in design course work may be attributed to the emphasis ABET placed on design starting in the 1980's.

This research established a baseline for the mechanical engineering programs studied at the

beginning of EC2000 implementation. A follow-on study is envisioned to be completed in the near future. This follow-on study will compare results and identify any significant changes in curricula as the EC2000 assessment process matures.

Author 1: Wayne Whiteman email: whiteman@me.gatech.edu

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