Educational Policies Committee Program Proposal, College of Engineering, July 13, 2012

Utah State University

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Section I: Request
Utah State University proposes to establish a center that builds on the College of Engineering’s strength in engineering education. The Center for Engineering Education Research (CEER) will conduct research examining innovative and effective engineering education practices as well as examining classroom technologies that advance learning and teaching in engineering. CEER represents the evolution of the successful National Center for Engineering and Technology Education (NCETE), a center funded by the National Science Foundation over the past eight years in excess of $10M.

Section II: Need
In 2004, the National Academy of Engineering (NAE) completed a study which envisioned the future for engineers and engineering in 2020 and identified the attributes and skills engineers might need to maintain America’s technological and economic competitiveness in 2020. The results of the study were published in “Educating the Engineer of 2020: Adapting Engineering Education to a New Center,” in which the NAE urged engineering deans to “endorse research in engineering education as a valued and rewarded activity as a means to enhance and personalize the connections to undergraduate students, to understand how they learn, and to appreciate the pedagogical approaches that excite them.” In the same time frame, the Carnegie Foundation for the Advancement of Teaching completed a study of the engineering profession and urged engineering educators to transform their programs so that students’ learning experience will more effectively prepare them to meet the ever changing demands of the profession. In response to the call from NAE and the Carnegie Foundation, the USU College of Engineering began development of an engineering education department with an affiliated PhD program. Approved by the Utah System of Higher Education Regents in 2008, USU is one of three programs in the country offering a doctoral degree program housed within a College of Engineering in the emerging discipline of engineering education. The creation of CEER will bring further distinction to USU as a leader in engineering education research. Within the state of Utah, as well as across the intermountain west, CEER is unique in its focused effort to conduct research into how engineering is learned, taught, and assessed. The long-term outcomes of CEER research will enable USU engineering programs, as well as engineering programs across the country, to maintain global leadership. This will be accomplished through the development of responsive engineering degree programs that can rapidly adjust to the changing needs of the economies and technologies of Utah and the nation, and that are equally open and available to all citizens.

Section III: Institutional Impact
CEER represents the evolution of the successful National Center for Engineering and Technology Education (NCETE), a center funded by the National Science Foundation over the past eight years in excess of $10M. NCETE research efforts will be refocused on engineering education research in the post-secondary arena. CEER will support collaboration and increase cohesion across engineering disciplines with a goal of improving research in and best practices of undergraduate
engineering education. Since CEER is housed within the College of Engineering, CEER researchers have opportunities to translate their research findings into practice within the engineering classrooms, especially within the pre-professional engineering programs on the Logan and regional campuses. The long-term impact of incorporating CEER research findings into the undergraduate classroom will be improved advising, teaching, and learning experiences for students leading to better retention of students and to well-prepared engineering graduates from the USU College of Engineering.

Section IV: Finances

There is no additional funding required to establish CEER. Costs anticipated for the Center activities will come from support through contracts and grants provided by state and federal agencies and from foundations. The CEER Director will be Professor Kurt Becker in the Department of Engineering Education. Professor Becker is Co-Principal Investigator of NCETE and has considerable experience in securing funding from the National Science Foundation and will use his expertise to establish a funding base for CEER. No new physical facilities will be required.