Committee on Educational Policy  
Final Findings and Recommendations  
Regarding the Internal Review of the  
Electrical and Computer Engineering Undergraduate Program

The Committee on Education Policy (CEP) thanks Jay Farrell, the chair of Electrical and Computer Engineering for his prompt response to the Preliminary Findings and Recommendations Report for the internal review of the Electrical Engineering Undergraduate Program.

The CEP was satisfied with the department’s response to recommendation 1. The ECE program has worked with the University Writing Program and BCOE to develop ENGR 181, a new technical communication course to be offered beginning Spring of 2017. This response goes beyond the CEP recommendations and shows a commitment to responding to this concern. The CEP was also satisfied with the response to student survey data in recommendation 2.

The CEP will continue to follow up with the ECE program on the success of ENGR181.

The Electrical Engineering (EE) program was established in 1989 and upon establishment of the Department of Electrical Engineering 1997, the program has been administered by that department. The first undergraduate degrees were awarded 1993 and, as of 2011, the program has awarded a total of 558 BS degrees. The EE program has been ABET-accredited continuously since 1994, most recently in 2006-2007. Enrollment for the 2011-12 academic year was 282 students with 32 degrees awarded. The EE department comprises 20 full-time equivalent tenure track faculty members. Currently the program is overseen by a Program Chair and an undergraduate adviser. Areas of specialization in the program include communications and signal processing, controls and robotics, computer engineering, integrated circuits, VLSI system design, intelligent systems, nanoscale devices and energy and power systems.

Two of the weaknesses identified by ABET were directed at the engineering program as a whole, while the third was directed specifically at Electrical and Computer Engineering.

1. The ABET Report states that “The university writing unit might explore opportunities to enhance its support of the engineering programs through better coordination with the technical writing courses that are offered within the Bourns College of Engineering.”

2. The ABET Report states “The mathematics unit relies heavily on short-term contract instructors, which might be affecting the ability to provide uniform and consistent coverage of mathematics topics in the engineering sections.” It was pointed out in the program response that the same textbooks, syllabus and exams are used by all of the math instructors, under the supervision of the department chair, to ensure a consistent curriculum for all of the engineering students. Additionally, the Mathematics department will consult with the BOURNS College of Engineering on special sequence courses for engineering students.

3. The ABET Report expressed concern over Criterion 4, Continuous Improvement. It was stated while there was evidence of assessment of student course materials and that course learning objectives were linked to student outcomes, the process for collecting the
information and quantifying student outcomes was unclear, raising the concern that the program could fall out of compliance with this criterion. In particular, the analysis relies heavily on responses from recent graduates and the program has been struggling to collect statistically significant information in this realm. The program response was that they will now follow a process that conforms to the 2013-2014 ABET guidelines, which eliminate the requirement for assessment and evaluation to determine achievement of graduates. The guidelines emphasize the periodic review of the educational outcomes to ensure they remain consistent with the institutional mission, the program constituents’ needs, and ABET criteria.

Findings and Recommendations:
1. CEP supports the program’s responses to the external review and feels the concerns were adequately addressed. However, CEP supports the ABET suggestion of greater involvement of the writing program and requests that the EE Program meet with the University Writing Program (UWP) to explore possible collaborations.
2. Student survey results were extremely positive; however, several concerns were raised that CEP would like addressed. These are:
   a) Class availability and scheduling: There were a number of comments in the student survey regarding the availability of courses, giving the impression that some students had to alter their entire trajectory for completion of the major if they didn’t get placed in a core course on time. CEP felt that if a course is a prerequisite for another required course, there should be sufficient availability to accommodate all of the students in the major.
   b) Quality of instruction of courses: CEP believes the effectiveness of instruction of the program’s courses should be better evaluated so that each instructor is enthusiastic and engaged in what he/she is teaching.
   c) Student perception of outdated labs: several students complained about the fact that labs were outdated and that lab equipment was in need of repair. In the interest of remaining a competitive program, CEP believes that updating the laboratories should be a priority.
   d) Funding for senior projects and sufficient research opportunities with equipment: Several students brought up the issue of availability of funds for research, such as are offered at competing institutions. CEP believes that funding for research opportunities will provide an essential supplement to the education offered in the program, while ensuring that the program remain competitive in recruiting top undergraduate students.