To be adopted: Proposed Major in Computer Engineering

I. Overview

The Departments of Computer Science and Engineering (CS&E) and Electrical Engineering (EE) propose the establishment of a B.S. degree entitled “Computer Engineering.” CS&E and EE will jointly administer the Computer Engineering major through a committee of two faculty members. The Chair of CS&E and the Chair of EE will each appoint one member to the committee. Changes in the overall curriculum must be approved by both the CS&E and EE Departments. Changes in the content of individual courses in CS&E and in EE will be approved by the individual departments.

Computer Engineering will remain permanently a joint offering by CS&E and EE, and will not have separate resources and will not become a separate department. All courses included in the Computer Engineering major, whether they are existing or newly created, shall be housed within existing departments. All faculty teaching courses to Computer Engineering majors shall be members of existing departments.

The degree requirements for the Computer Engineering major will appear as a separate listing in the UCR General Catalog, which begins with the statement:

The Computer Engineering major is jointly offered by the Departments of Computer Science & Engineering and Electrical Engineering.

followed by the degree requirements for the Major. No list of associated faculty will be given.

II. The Major

Major requirements for the Bachelor of Science in Computer Engineering are as follows:

Lower-division requirements (67 units)

a) MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B, MATH 46
b) CS 010, CS 012, CS 014 (formerly CS 140A), CS 61 (formerly CS 013)
c) EE 001A, EE 001B
d) PHY 040A, PHY 040B, PHY 040C
e) One course of four or more units in Chemistry to be selected in consultation with a faculty advisor

Upper-division requirements (83 units minimum)

a) MATH 112, MATH 113
b) STAT 155
c) CS 120A / EE 120A, CS 120B / EE 120B, one course from (CS 122A, EE 128)
d) CS 141 (formerly CS 140B), CS 161, CS 180 (Software Engineering)\(^1\), one course from (CS 160, CS 163)
e) EE 100A, EE 100B, EE 110A, EE 110B, EE 141
f) Five courses as technical electives from the following set of CS&E and EE upper-division courses:
   CS 121, CS 122A, CS 122B, CS 130, CS 150, CS 160, CS 163, CS 164, CS 166, CS 168,
   CS 170, CS 171, CS 177, CS 181, CS 182, CS 193
   EE 102, EE 105, EE 115, EE 128, EE 132, EE 144, EE 146, EE 150, EE 151, EE 152,
   EE 175A, EE 175B, EE 1xx (Computer Aided Circuit Design), EE 1yy (DSP Implementation and Architectures)

The selection of technical electives must be planned, in consultation with a faculty advisor, to include at least one coherent sequence of two classes from either CS&E or EE. The technical electives must be distinct from those used to satisfy the upper-division requirements specified in a-e above.

1 Courses shown with titles in italic are proposed new technical electives.

Students may petition for exceptions to the above degree requirements. Exceptions to CS&E course requirements must be approved by the CS&E undergraduate advisor or chair, and to the EE course requirements by the EE undergraduate advisor or chair. Exceptions to other requirements require the approval of both the CS&E and EE undergraduate advisors or chairs.

III. Justification

The proposed Computer Engineering major will allow students to complete a B.S. degree that covers a broad range of topics from both computer science and electrical engineering, including hardware and software, the design of computer systems and their application. The required courses ensure a sufficiently broad background in topics required for computer engineering. The technical electives allow students the freedom to specialize in one or two of the sub-disciplines of computer engineering. The proposed major offers a unique combination of courses not currently possible within existing UCR degree programs.

Industry is very interested in hiring students with this range of skills. In particular, the UC system is planning to increase engineering enrollments by 40% state wide, in response to the demand from industry. Much of this growth is targeted in the areas of computer science, electrical engineering and computer engineering.

The new major makes efficient use of resources because it is structured as a joint offering by the CS&E Department and the EE Department. This avoids duplication of effort between the two departments while allowing students to pursue a broad array of specialized interests within the field of computer engineering. By the academic year 2005-06, the undergraduate enrollment in the UCR College of Engineering is projected to grow to approximately 1,930 students, including about 300 Computer Engineering majors. These plans for growth already include the necessary resources for supporting Computer Engineering.

Approvals:
Approved by the Department of Computer Science and Engineering on 11/27/98.
Approved by the Department of Electrical Engineering on 11/24/98.
Approved by the College of Engineering Executive Committee on 12/2/98.
Approved by the Committee on Educational Policy on 12/9/98.