TO: The Academic Senate

FROM: The Committee on Instruction and Curriculum (CIC)

SUBJECT: Modification of the Engineering Degree Options

PURPOSE: For Action by the Academic Senate

ACTION REQUESTED: That the Academic Senate approve the attached Modification of the Engineering Degree Options, which decreases the required number of units for each Option; effective for the 2010-11 catalog

BACKGROUND INFORMATION: The CSU request to decrease the total number of units for degree offerings to 180 total has been an ongoing effort at CSUEB. Engineering had a particularly large requirement for units to graduate and their proposed “Re-Engineering the Engineering Degree at CSUEB” is attached. The proposal was reviewed by CIC at its meeting on April 20, 2009 and was unanimously approved by CIC, with the correction of an error noted by CIC on the original proposal. The Critical Thinking Subcommittee will review the modules developed for the Engineering courses.

Additional Background Information: The CSU Deans of Engineering, working together to advance the Chancellor’s industry partnership initiative, have begun a system-wide effort to engage CSU campuses in the review and possible reform of baccalaureate engineering programs. There are two issues. One of the issues is producing more engineers to meet industry demands. The second issue is graduating engineers in a timely manner. Engineering degrees in the CSU exceed the 180 minimum due to the accreditation requirements of ABET. The Deans of Engineering are focusing on increasing the number of engineer graduates. Vice Chancellor Gary Reichard, in a memo dated November 5, 2008, asked provosts and faculty to review the engineering curriculum to see if it could be redesigned, including reducing the number of units required for the baccalaureate degree.

As a result, Saeid Motavalli, Chair of the Department of Engineering, Sally Murphy, Director of General Education, and Carl Bellone, AVP of Academic Programs and Graduate Studies began meeting to examine the curriculum of the B.S. in Engineering at CSUEB. The B.S. in Engineering at CSUEB requires 204 to 206 units (depending upon the option) which is significantly over the 180 minimum. By contrast, a B.S. in Engineering at UC Berkeley or UC Davis are the minimum of 120 semester or 180 quarter units. Because the units for the B.S. in Engineering at East Bay is so high, (only four other CSUEB BA/BS degrees exceed 180 and none by more than 3 units) it takes Engineering students a half year longer (2 quarters) and over $2,000 to earn a B.S. degree than it does for a student to earn a non-Engineering bachelor’s degree.

In order to reduce the number of units for the BS in Engineering and still meet the accreditation requirements of ABET and the GE requirements of the university, two actions emerged. One, it was possible to reduce Engineering major by 4 units. And two, the additional unit reduction would need to come from a redesign of the GE requirements for Engineering majors. The proposed modification of GE is strictly limited to majors that, due to accreditation standards beyond their control, result in the major significantly exceeding 180 units. Since no other major is over 183 units, this proposed modification of GE applies only to Engineering.

The proposed redesign involves double counting of GE requirements and curricular redesign based upon the Senate approved student learning outcomes for GE. Issues pertaining to this redesign involved the departments of English, Philosophy, History, and Political Science. The Chairs of each of these departments were consulted and, with their help and support, a plan was developed that was acceptable to all concerned. The Chair of the Academic Senate was also kept informed of these developments.
Current Major Options:

- **Computer Engineering:**
  - Current unit total: 206 units

- **Industrial Engineering:**
  - Current unit total: 204 units

1. **Reduction of each major by one Engineering course** (rec’d college approval in Fall 08)
   - 4 units Computer Eng. (total degree units = 202)
   - 2 units Industrial Eng. (total degree units = 202)

2. **Double counting of US History, Constitution and American Ideals Code Requirement divided between humanities and social science general education requirements**
   - 8 units toward degree completion (total degree units for each option = 194)

   NOTE: Double counting Code requirement courses to fulfill GE requirements is subject to the following conditions:
   a. May be allowed only when the degree program is subject to outside accreditation requirements, and
   b. When the accreditation requirements plus the CSUEB graduation degree requirements push the unit total for the degree significantly above the 180 minimum required to graduate from the CSU.

3. **Major activity units (which are required major courses) to count toward fulfillment of the activity requirements for Area F in GE**
   - 4 units toward degree completion (total degree units for each option = 190)

   NOTE: This is already allowed for transfer students to CSUEB. The courses are required by the major, which assures that students will fulfill the Area F requirement. APGS handles approval of individual courses for Area F, based on the percentage of activities in the course.

4. **Integration of “Critical Thinking in Engineering” into the curriculum**
   - 4 units toward degree completion (total degree units for each option = 186)

   NOTE: Instead of requiring a separate Critical Thinking course, a series of modules, originally designed to meet the Senate-approved learning outcomes by faculty in the Philosophy Department, will be integrated into each of the required problem solving courses in the Engineering curriculum.

5. **Modification of ENGR 1011 Engineering: An Introduction into an integrated Engineering and second composition (English 1002) course.**
   - 4 units towards degree completion (total degree units for each option = 182)

   New total for each Engineering Option: 182 units