CALIFORNIA STATE UNIVERSITY, EAST BAY

TO: The Academic Senate

FROM: Committee on Academic Planning & Review (CAPR)

SUBJECT: New Engineering BS degrees in Computer Engineering and Industrial Engineering and discontinuance of the BS in Engineering and its options with the same names

PURPOSE: For Action by the Academic Senate

ACTION
REQUESTED: That the Academic Senate approve the request of the Engineering program to establish two new BS degrees in the following fields:
- Computer Engineering
- Industrial Engineering

to be placed on the Academic Plan effective Fall 2012, and to discontinue the BS in Engineering and its 2 options with the same names, changed to coincide with the effective date of the new BS degrees

BACKGROUND:

CAPR unanimously recommended at its December 02, 2010 meeting that the Academic Senate approve the establishment of two new BS degree programs within the Engineering program in Computer Engineering and Industrial Engineering. The BS in Computer Engineering and BS in Industrial Engineering are both listed currently as options under the same degree program. However, the two programs are very different and thus should not be considered options under the same degree and for accreditation purposes it would be better for them to be separate majors. The department has also requested the discontinuance of the BS Engineering degree and its two options ~~for the 2011-12 catalog~~. There are no curriculum changes from options to full degrees. The purpose of these two new degrees is to attract better students, improve program credibility in the field, and resolve confusion on the part of the accreditation body.

(see also 10-11 CIC 8)

Academic Master Plan and Resource Implication Form

Please provide a brief (3 to 5 pages) Summary of the proposal, justifying adding projections to the Academic Plan or significant modifications thereof. These questions should be answered for New Degrees/Options/Minors/Certificates/Credentials/SSMPPs and for proposed significant Modifications to Degrees/Options/Minors/Certificates/Credentials/SSMPPs. Discontinuances will use the discontinuance form, unless it is part of a significant modification, in which case it may be included in this summary.

- Department and/or Degree Program: Department of Engineering, B.S. Computer Engineering

- Action Requested: New B.S. degree program in Computer Engineering to replace the Option in Computer Engineering within the B.S. Engineering degree.

  Requested Catalog Date: Fall 2011

Summaries should include the following elements, which are the criteria by which proposed changes to the Academic Master Plan are evaluated:

- A brief summary of the purpose and characteristics of the proposed degree program (or proposed modification/option/ minor/etc).

  The Department of Engineering offers two undergraduate options in the B.S. Engineering. They are an option in Computer Engineering and the other, an option in Industrial Engineering.   The degree that the graduates receive is a degree in Engineering with options in Computer or Industrial Engineering. We are planning to apply for accreditation of our Computer Engineering Option. We have always had trouble describing to our accreditation agency and our prospective students the reason we are offering options as opposed to separate degree programs. The word "option" lowers the perception of our Computer Engineering degree program and makes us less competitive in attracting quality students. Students assume that options in industrial and computer engineering are minor variations of the same degree program which do not rigorously prepare them in their specialty. Computer Engineering and Industrial Engineering have few lower division engineering courses in common and thus they are not really options under the same degree. Also, our graduates are at a disadvantage in seeking employment because the majority of employers do not recognize "option" as a full-fledged engineering specialty. Therefore, we propose to discontinue the B.S. in Engineering with an option in Computer Engineering, and replace it with a new degree program: Bachelor of Science in Computer Engineering. The Department of Engineering offers several degree programs besides the B.S. in Engineering. These include an undergraduate degree in Construction Management and two graduate degree programs in Construction Management and Engineering Management.

- How the program fits into the campus mission and strategic plan

  The option in Computer Engineering within the B.S. in Engineering is already being taught at CSU East Bay and is in our Master Plan. Increasing the numbers of graduates with degrees in STEM disciplines is also a key component of our campus Academic Master Plan. Therefore, this change to elevate the option in Computer Engineering to a full Bachelor's level degree would fit well in the CSUEB Master Academic Plan.

- Whether the program is offered through

    X   state support or

    ☐   special sessions

- How does the request relate/compare to other CSU/UC/private universities?

  Several CSU/UC schools offer a B.S. degree in Computer Engineering. In fact, having an option in Computer Engineering within a B.S. in Engineering degree is unusual. Among others, Cal Poly SLO, San

Jose State, San Francisco State, Cal Poly Pomona, Cal State Northridge, and UC Berkeley offer a B.S. in Computer Engineering.   It is also common in private schools to offer a computer engineering degree program. University of Southern California is one such institution.

- Anticipated student demand year 1: 40 (current);   year 3: 90;   year 5: 120;   year 10: 150

- Estimated workforce demands and employment opportunities for graduates

  Computer Engineering is the field of study which deals with design and implementation of embedded computer systems. These systems are now an integral part of various products such as automobiles, cell phones, and various industrial systems. Computer engineers are in high demand in automotive, communication and industrial automation industries.

- Other relevant societal needs

  The wealth of a nation depends on the quantity and quality of goods produced and services delivered. The majority of modern manufactured goods depend heavily on embedded computer systems. Computer Engineers thus provide California with the technical expertise to increase the competitiveness of our modern industry and increase the standard of living of Californians.

- An assessment of the required/anticipated resources needed and a campus commitment to allocating those resources (or possible changes to current resources, including library collections). If no new resources are requested, provide justification/explanation.

  We are changing the name from an option to a standalone degree program. No new resources are requested as we will not be changing the curriculum. We have in place the faculty, Department, College and Library resources to continue to support this program.

- And, as applicable:

  - If the projection is a pilot program, also list the academic years during which the program will operate in pilot status. (Pilot programs are rarely (if ever) done at CSUEB. Contact the AVP, Academic Programs if you have questions about this). N/A

  - If the projected program is now offered as an option, concentration, or emphasis, provide a brief rationale for elevation to a full degree program.

  We are planning to apply for accreditation for our Computer Engineering Option in the near future. We have always had trouble describing to our accrediting agency and our prospective students the reason we are offering options as opposed to separate degree programs. The word "option" lowers the perception of our Engineering degree program and makes us less competitive in attracting quality students. The two options in Computer Engineering and Industrial Engineering within the B.S. in Engineering degree have only a few lower division engineering courses in common and thus they are not really options under the same degree. Also our graduates are at a disadvantage in seeking employment because the majority of employers do not recognize "option" as a fully fledged Engineering specialty.

- For new degree programs that are not commonly offered as a bachelor's or master's degree, please provide a compelling rationale explaining how the proposed subject area constitutes a coherent, integrated degree program that has potential value to students and meets CSU requirements for an academic program at the undergraduate or graduate level. New bachelor's degrees should be as enduring as possible in content and title. Breadth is the hallmark of bachelor's degrees, and more narrow specialization occurs at the master's level. N/A

  - If a discontinuation is reported to us for the first time, please confirm that all campus and system-level policies regarding discontinuation have been followed.

  - If it is interdisciplinary in nature, please note involvement by other departments and faculty.

> Consultation with other affected departments *prior* to submission to the college and posting to the Curriculum Sharepoint site. Indicate departments consulted and whether or not objections were raised. Describe objections or concerns.

> Additional comments or issues

Department Chair signature (indicating approval by the department faculty)

Original signed by Saeid Motavalli   Date 9/28/10

Dean's signature (indicating approval by the college curriculum committee and acknowledgement of resource implications)

Original signed by Alan Monat   Date 10/21/10

Academic Master Plan and Resource Implication Form

Please provide a brief (3 to 5 pages) Summary of the proposal, justifying adding projections to the Academic Plan or significant modifications thereof. These questions should be answered for New Degrees/Options/Minors/Certificates/Credentials/SSMPPs and for proposed significant Modifications to Degrees/Options/Minors/Certificates/Credentials/SSMPPs. Discontinuances will use the discontinuance form, unless it is part of a significant modification, in which case it may be included in this summary.

- Department and/or Degree Program: Department of Engineering, B.S. Industrial Engineering

- Action Requested: New B.S. degree program in Industrial Engineering to replace the Option in Industrial Engineering within the B.S. Engineering degree.

  Requested Catalog Date: Fall 2011

Summaries should include the following elements, which are the criteria by which proposed changes to the Academic Master Plan are evaluated:

- A brief summary of the purpose and characteristics of the proposed degree program (or proposed modification/option/minor/etc).

  The Department of Engineering offers two undergraduate options in the B.S. in Engineering. They are an option in Computer Engineering and the other, an option in Industrial Engineering. The degree that the graduates receive is a B.S. degree in Engineering with options in Computer or Industrial Engineering. Our Industrial Engineering program is accredited by ABET. We have always had trouble describing to our accreditation agency and our prospective students the reason we are offering options as opposed to separate degree programs. The word "option" lowers the perception of our Industrial Engineering option in the B.S. in Engineering program and makes us less competitive in attracting quality students. Students assume that options in industrial and computer engineering are minor variations of the same degree program which do not rigorously prepare them in their specialty. Computer Engineering and Industrial Engineering have few lower division engineering courses in common and thus they are not really options under the same degree. Also our graduates are at a disadvantage in seeking employment because the majority of employers do not recognize "option" as a fully fledged engineering specialty. Therefore, we propose to discontinue the B.S. in Engineering degree with option in Industrial Engineering, and replace it with a new degree program: Bachelor of Science in Industrial Engineering. The Department of Engineering offers several degree programs besides the B.S. in Engineering. These include an undergraduate degree in Construction Management and two graduate degree programs in Construction Management and Engineering Management.

- How the program fits into the campus mission and strategic plan

  The option in Industrial Engineering within the B.S. in Engineering is already being taught at CSU East Bay and is in our Master Plan. Increasing the numbers of graduates with degrees in STEM disciplines is also a key component of our campus Academic Master Plan. Therefore, the change to elevate the option in Industrial Engineering to a full Bachelor's level degree would fit nicely in CSUEB Master Plan.

- Whether the program is offered through

    X   state support or

    ☐   special sessions

- How does the request relate/compare to other CSU/UC/private universities?

  Several CSU/UC schools offer B.S. degree in Industrial Engineering. In fact, having an option in Industrial Engineering within a B.S. in Engineering degree is unusual. Among others, Cal Poly SLO, San Jose State, Cal Poly Pomona and UC Berkeley offer B.S. in Industrial Engineering degrees.   It is also common in private schools to have an industrial engineering degree program. The University of Southern California is one such institution.

- Anticipated student demand year 1: 100 (current);   year 3: 120;   year 5: 150;   year 10: 250

- Estimated workforce demands and employment opportunities for graduates

  According to our latest survey, 98% of our Alumni are either employed or pursuing graduate degree programs. We have not had difficultly placing our students in related industries. Companies that are hiring Industrial Engineers include companies in both manufacturing and service sectors. Companies such as INTEL, UPS, USPS, Target, and American Airlines hire industrial engineers.

- Other relevant societal needs

  The wealth of a nation depends on the quantity and quality of goods produced and services delivered. Industrial Engineers are trained to improve operations of production and service providing systems in terms of quality, productivity and cost reduction. As such industrial engineers can make significant contributions to the well being of society.

- An assessment of the required/anticipated resources needed and a campus commitment to allocating those resources (or possible changes to current resources, including library collections). If no new resources are requested, provide justification/explanation.

  We are changing the name from an option to a standalone degree program. No new resources are requested as we will not be changing the curriculum. We have in place the faculty, Department, College and Library resources to continue to support this program.

- And, as applicable:

  - If the projection is a pilot program, also list the academic years during which the program will operate in pilot status. (Pilot programs are rarely (if ever) done at CSUEB. Contact the AVP, Academic Programs if you have questions about this). N/A

  - If the projected program is now offered as an option, concentration, or emphasis, provide a brief rationale for elevation to a full degree program.

  Our Industrial Engineering program is accredited by ABET. We have always had trouble describing to our accrediting agency and our prospective students the reason we are offering options as opposed to separate degree programs. The word "option" lowers the perception of our Engineering degree programs and makes us less competitive in attracting quality students. Computer Engineering and Industrial Engineering only have a few lower division engineering courses in common and thus they are not really options under the same degree. Also our graduates are at a disadvantage in seeking employment because the majority of employers do not recognize "option" as a fully fledged Engineering specialty.

- For new degree programs that are not commonly offered as a bachelor's or master's degree, please provide a compelling rationale explaining how the proposed subject area constitutes a coherent, integrated degree program that has potential value to students and meets CSU requirements for an academic program at the undergraduate or graduate level. New bachelor's degrees should be as enduring as possible in content and title. Breadth is the hallmark of bachelor's degrees, and more narrow specialization occurs at the master's level. N/A

  - If a discontinuation is reported to us for the first time, please confirm that all campus and system-level policies regarding discontinuation have been followed.

> ➤ If it is interdisciplinary in nature, please note involvement by other departments and faculty.

> ➤ Consultation with other affected departments *prior* to submission to the college and posting to the Curriculum Sharepoint site. Indicate departments consulted and whether or not objections were raised. Describe objections or concerns.

> ➤ Additional comments or issues

Department Chair signature (indicating approval by the department faculty)

Original signed by Saeid Motavalli   Date 09/28/10

Dean's signature (indicating approval by the college curriculum committee and acknowledgement of resource implications)

Original signed by Alan Monat   Date 10/21/10

CALIFORNIA STATE UNIVERSITY, EAST BAY

REQUEST FOR APPROVAL OF DISCONTINUANCE OF THE B.S ENGINEERING

1. **Department**: Engineering

2. Full and exact title of program: B.S. Engineering

3. List of **other majors, options, minors, certificates, or credentials** in the major/department.
   Computer Engineering Option
   Industrial Engineering Option

4. **Purpose** of the Proposed Discontinuance. To change existing options to majors. The two programs are very different and cannot be considered options under the same degree. For accreditation purposes it would be better for them to be separate majors. A request for a BS in Computer Engineering and a BS in Industrial Engineering are being proposed.

5. **How many students** are currently pursuing this major? 180

6. The **Department is responsible for accommodating students** who are currently pursuing this major in finishing their program. There will be no effect on existing students. Those graduating in Fall 2011 or later will have the opportunity to change their major to the appropriate new degree program.

7. **RESOURCE IMPLICATIONS:** There will be no resource implications

8. **CONSULTATION** with other affected departments and program committee:

   a) The following **department(s)** has (have) been consulted and raise **no objections**:
      All Academic Departments and Programs at CSUEB were consulted, using the Curriculum Sharepoint website, and there were no objections.

   b) The following **department(s)** has (have) been consulted and **raise concerns**: None
      Department:
      Concern:

9. Certification of **DEPARTMENT APPROVAL** by the chair and faculty.

   Chair: Original signed by Saied Motavalli   Date: 9/28/10

10. Certification of **COLLEGE APPROVAL** by the dean/associate dean and college curriculum committee.

    Dean/Associate Dean: Original signed by Alan Monat   Date: 10/21/10