MEMORANDUM

TO: Darryll Pines
   Dean, A. James Clark School of Engineering

FROM: Elizabeth Beise
       Associate Provost for Academic Planning and Programs

SUBJECT: Proposal to Establish a Combined Bachelor’s/Master’s Program in Chemical Engineering (BS) and Systems Engineering (MS) (PCC log no. 14048)

At its meeting on May 1, 2015, the Senate Committee on Programs, Curricula, and Courses (PCC) approved your proposal to establish a combined Bachelor’s/Master’s Program in Chemical Engineering (BS) and Systems Engineering (MS). A copy of the approved proposal is attached.

The change is effective Fall 2015. Please ensure that the change is fully described in the Graduate and Undergraduate Catalogs and in all relevant descriptive materials, including the undergraduate program’s four-year plan (contact Lisa Kiely at lkiely@umd.edu for more information).

MDC/

Enclosure

cc: Gregory Miller, Chair, Senate PCC Committee
    Barbara Gill, Office of Student Financial Aid
    Reka Montfort, University Senate
    Erin Taylor, Division of Information Technology
    Pam Phillips, Institutional Research, Planning & Assessment
    Anne Turkos, University Archives
    Linda Yokoi, Office of the Registrar
    Cynthia Stevens, Undergraduate Studies
    Alex Chen, Graduate School
    William Fourney, A. James Clark School of Engineering
    Sheryl Ehrman, Department of Chemical and Biomolecular Engineering
    Reza Ghodssi, Institute for Systems Research
THE UNIVERSITY OF MARYLAND, COLLEGE PARK
PROGRAM/CURRICULUM/UNIT PROPOSAL

• Please email the rest of the proposal as an MSWord attachment to pcc-submissions@umd.edu.
• Please submit the signed form to the Office of the Associate Provost for Academic Planning and Programs, 1119 Main Administration Building, Campus.

College/School: Please also add College/School Unit Code: First 8 digits: 01203200
Unit Codes can be found at: https://happrop.umd.edu/Html_Reports/units.htm

Department/Program: Please also add Department/Program Unit Code: Last 7 digits: 3203200

Type of Action (choose one):

☐ Curriculum change (including informal specializations) ☐ Renaming of program or formal Area of Concentration
☐ Addition/deletion of formal Area of Concentration ☐ Suspend/deactivate program
☐ New academic degree/award program ☐ New Professional Studies award iteration
☐ New Minor ☐ Other

Indies indicate that the proposed program action must be presented to the full University Senate for consideration.

Summary of Proposed Action:

We propose a five-year BS+MSSE program open to undergraduate students in the Chemical & Biomolecular Engineering undergraduate program, leading to a CHBE Bachelor of Science degree and a (with thesis) Master of Science in Systems Engineering from the Institute for Systems Research. The program would significantly strengthen the CHBE undergraduate systems engineering experience, provide a new source of MSSE students for the ISR, and open new employment opportunities for CHBE graduates in industrial sectors that do not traditionally recruit CHBE graduates.

APPROVAL SIGNATURES - Please print name, sign, and date. Use additional lines for multi-unit programs.

1. Department Committee Chair
   Mr. Adams 10/28/2014
2. Department Chair
   Dr. Ehrman 10/29/2014
3. College/School PCC Chair
   Dr. Brea 1/13/15
4. Dean
   Dr. Kemp 1/21/2015
5. Dean of the Graduate School (if required)
   Dr. Goto 6/1/15
6. Chair, Senate PCC
   Dr. Hackett
7. University Senate Chair (if required)
8. Senior Vice President and Provost
   Dr. 02/03/2015
9. Department Chair #2
   Dr. 01/2015
Proposal for a CHBE BS/MSSE five year program

Prepared by Raymond A. Adomaitis
Department of Chemical and Biomolecular Engineering
Institute for Systems Research
University of Maryland

Last updated: 27 October 2014

Rationale

1. The proposed program offers interested students a strong foundation in process systems engineering (PSE) concepts that currently cannot be met with the small number of CHBE PSE faculty.

2. Opens new employment opportunities for CHBE students in the Washington, DC area, particularly with defense contractors.

3. Timetable: to start (with the first set of CHBE juniors) in Fall 2015

Current senior CHBE year

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<thead>
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<th>Current Senior, Fall</th>
<th>Current Senior, Spring</th>
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<tr>
<td>Course</td>
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<tr>
<td>Total</td>
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</table>

Proposed program

Courses shown below in **Black** are unchanged from the CHBE BS plan of study, **Blue** count only towards the MSSE degree, and **Red** are classes that are double-counted towards the CHBE BS and ISR MSSE degrees:

<table>
<thead>
<tr>
<th>Senior, Fall</th>
<th>CR</th>
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<tr>
<td>CHBE 442</td>
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<td>History &amp; Social Sciences</td>
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<td>CHBE 444</td>
<td>3</td>
<td>ENSE 622 (CHBE technical elective)</td>
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</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>Total</td>
<td>12</td>
</tr>
</tbody>
</table>
Application and evaluation process

- Chemical & Biomolecular Engineering students in their sixth semester who are interested in this program must apply by March 1. The students will be required to provide three letters of recommendation, preferably from faculty in the CHBE department; a minimum GPA of 3.0 is required to be considered for this program. Applications will be reviewed by the Undergraduate Studies Committee of the CHBE Department; students accepted into the program by this committee also will be reviewed by the ISR Education Program Committee prior to final acceptance into the program.

- Students accepted into the program will be advised to pursue research during their senior year on a topic suitable for MSSE thesis research.

- Undergraduate students in their eight semester will apply to the ISR MSSE program by March 1, following the admissions procedures of all other MSSE students; no GRE scores, however, are required for application.

Questions and Answers

1. Q: What will be the time-table for accepting CHBE students first into the combined program and then into the MSSE program? A: CHBE students should apply to the joint program to the CHBE department at the start of their sixth they will then apply to the MSSE program with all other MSSE applicants after their seventh semester using the same procedure as all other MSSE applicants.

2. Q: Who will act as advisors to the MSSE students? A: ISR faculty and affiliates, preferentially those from the CHBE department.

3. Q: Does the degree program require a thesis? A: Generally, the MSSE degree is a thesis degree; the proposed program above corresponds to the thesis option. Students may pursue a non-thesis option; they will be required to submit a scholarly paper that is reviewed by several ISR faculty and replace the research credits with approved technical electives.

4. Q: What if the students need to leave the program during their senior CHBE year? A: Replace ENSE 622 with a CHBE-approved elective or request that ENSE 622 count as a CHBE-approved elective; no other changes to the senior year are required.

5. Q: Can ENES 489P be used in place of ENSE 621 A: No - university regulations require all classes double-counted in a BS+MS program be 600-level or above. Furthermore, ENES 489P cannot be used as the third CHBE technical elective.
6. **Q:** Is this an ABET accredited program? **A:** The BS CHBE degree program is ABET accredited; the CHBE BS degree will be awarded in spring of the senior year. The MSSE program is not accredited.

7. **Q:** Is the GRE required to apply for the MSSE? **A:** The GRE is not required for current University of Maryland undergraduate students.

8. **Q:** What can students do in the summer between the eight and ninth semesters? **A:** Having taken two core ENSE classes, potential internship opportunities may open to the students.

Note that the University of Maryland has a policy in place for double counting class credit in BS/MS programs:

**Combined Bachelor’s/Master’s Degrees Form** With the approval of the Department and completion of program requirements, an undergraduate degree-seeking student can request to join the combined bachelor’s/master’s (BS/MS) program. In the BS/MS program, **graduate level courses** initially taken for undergraduate credit may also be applied towards the graduate credit requirements for a master’s degree program at the University of Maryland. Return form to 1131 Martin Hall. For the form, see:

Dear Jenna,

Please accept this as a letter supporting the PCC proposal submitted by Professor Ray Adomaitis (CHBE/ISR) describing a new, 5-year CHBE BS+MSSE program. Ray, who also is the Director of Undergraduate Studies in CHBE, has worked closely with the faculty of his home department as well as ISR in developing this important proposal.

Together with John MacCarthy, Director of the Systems Engineering Education Program in ISR, over the past semester Professor Adomaitis has created a BS+MSSE program that satisfies all of the requirements of the MSSE program and promises to attract research-active CHBE students with a strong interest in Systems Engineering to our MSSE program. Professor Adomaitis and I have consulted a number of times over this program, and he has also met with the ISR Education Program Committee (EPC) as well as some of our ISR faculty experts in the Systems Engineering Program (i.e. Professors John Baras, Mark Austin, David Lovell, Jeffrey Herrmann) not just to describe the proposal, but to explore how it can be used as a template for other departments as well.

On behalf of the ISR, I fully support the proposed BS+MSSE program. I believe it will benefit both departments significantly by strengthening the process systems experience of CHBE students and by providing a new source of MSSE students for the ISR and our college.

Please let me know if you have any questions and/or need more information.

Thanks and best regards,

—Reza

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