Final Report
2012-2013 Academic Year

University of Iowa
College of Engineering
Curriculum Committee

The 2012-2013 UI College of Engineering Curriculum Committee consists of:

<table>
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<th>Members</th>
<th>Term Expiring</th>
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<tr>
<td>Eric Nuxoll (Chair)</td>
<td>May 2013</td>
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<td>Soura Dasgupta</td>
<td>May 2013</td>
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<td>Edwin Dove</td>
<td>May 2014</td>
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<td>Olesya Zhupanska</td>
<td>May 2015</td>
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<td>Allen Bradley</td>
<td>May 2015</td>
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<td>Dean Keri Hornbuckle, ex officio nonvoting</td>
<td>May 2013</td>
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<td>Ken Wacha, student representative nonvoting</td>
<td>May 2013</td>
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and its Engineering Faculty Council liaison is Thanos Papanicolaou.

The Committee’s general charge is “The Curriculum Committee shall be responsible for reviewing and evaluating all existing and any proposed curricula within the college, for reviewing and evaluating all existing and any proposed courses taught within the college or required in any of its curricula, and for making appropriate recommendations to the dean and the faculty.”

The Committee’s specific charges for the 2012-2013 academic year are:

1. Review Course Activity Reports (CAR) for the College of Engineering core curriculum courses (59: xxx & non-college courses) in coordination with the core course coordinators. Include an analysis of the format and the level of detail that should be required in the CARs. If specific problems need addressing, either with the overall process or with individual courses, report these to the EFC.

2. Continue to monitor course quality for the math, physics and chemistry courses in the College of Engineering Curriculum.

3. Learn about the changes in the University Honors Program, how these changes affect the College of Engineering Honors Program, and work with the Dean’s office to increase awareness of these opportunities to Engineering students and faculty.


Regarding Charge #1:

The Committee reviewed the CARs for all of the 059:xxx courses in the College. All CARs for these courses contain a log describing changes and qualitative self-evaluations for each offering of the course; some CARs contain quantitative evaluations, even though this component is no longer mandated. The Committee concluded that each 059:xxx course appears to be running well; the Committee had no recommendations for changes.

In discussion with the EFC following the interim report, the Committee agreed to determine the degree of assessment and oversight in place for the 057:xxx courses. The Committee determined that this degree of assessment and oversight varied widely, from meticulously maintained quantitative CARs reviewed by their subscribing departments, to no written assessment whatsoever. Recognizing the value of a log describing successes, failures, and changes in a course, particularly for new instructors, the Committee offers the following recommendation:

Recommendation #1: For each 057:xxx course the subscribing departments collectively determine the level of course activity record keeping needed.

Regarding Charge #2:

Associate Dean Hornbuckle has been working with the Mathematics Department on inconsistencies between sections of 22M:034, highlighted by the Department of Mechanical and Industrial Engineering. The Committee worked with Dean Hornbuckle to drive forward these discussions, resulting in an agreement by the Mathematics Department to require all non-tenure-track instructors of 22M:034 to adopt a common syllabus and administer common exams.

The Committee reviewed the syllabi and final exams for all four core engineering math courses. Course coverage in all these courses was appropriate. There was concern in the committee about the exclusively multiple choice exams in 22M:031 Engineering Math I and 22M:032 Engineering Math II. Multiple-choice questions do not encourage a student to develop an argument, or effectively communicate and demonstrate the processes involved in solving the problem. Further, they do not differentiate between a minor error and a major conceptual error. In the Committee’s view, a greater emphasis on the problem-solving process is needed, prompting the committee to draft the following recommended charge:

Recommended Charge #1: To consider whether it is pedagogically appropriate for introductory courses in Mathematics, Physics, and Chemistry to rely exclusively on multiple-choice questions in exams.

The Committee also examined the 2012 syllabi and final exams for 004:011 and 004:012 Principles of Chemistry I and II, respectively. The exams for these courses are also multiple choice, but since the material consists largely of a broad range of smaller individual concepts rather than vertically-integrated ones, the committee was less concerned about this. The Committee found the chemistry courses to have adequate coverage and instruction, and found the Chemistry Department to be quite responsive to our requests.

The Committee reviewed the syllabus and exams for the two Physics courses and concluded that while the coverage was good, the exclusive reliance on multiple choice questions for the exams is of concern. This is addressed in Recommended Charge #1 above. There is anecdotal evidence from current engineering students about serious problems in the Physics
courses. In recent years there also has been some difficulty in communicating effectively with the Department of Physics and Astronomy regarding these courses. This prompts the committee to suggest the following recommended charge:

**Recommended Charge #2:** Explore avenues to improve communications between the Curriculum Committee and the Department of Physics and Astronomy.

**Regarding Charge #3:**

There are three ways in which a student can graduate with honors from the UI College of Engineering:

- The most straightforward is Latin Honors (cum laude, magna cum laude, summa cum laude), applied automatically based strictly on GPA.

- The College of Engineering’s Honors in the Major program has a minimum GPA requirement (3.33), a required written report on a faculty-supervised project which cannot be used for credit toward graduation, and completion of 057:001 Engineering Honors Seminar, where the student will give an oral presentation on their project.

- The University Honors Program has a separate set of requirements, but they are being changed to more closely align with the College of Engineering’s Honors in the Major program. The University Honors Program requires that students complete 24 semester hours of honors coursework. Under the new guidelines, 12 of these semester hours may come from mentored research, study abroad, internships or co-ops, completion of the Grand Challenges Scholars Program, or approved community engagement experiences (tutor, TA, student ambassador, etc.). Any student completing the Honors in the Major requirements will automatically log 12 honors semester hours.

- The University Honors Program has also changed their enrollment process, switching from automatic enrollment of qualified incoming students to an opt-in program. Qualified incoming students (ACT >= 27 + GPA >= 3.8, or ACT >= 30 + GPA >= 3.7) will be invited to join the University Honors Program, but must accept the invitation to be enrolled. Current students with a GPA of 3.33 or higher can also be invited to enroll upon their request.

The Committee noted that the requirements for the University Honors Program are now much more aligned with activities many of our students already do, and that the structure, resources and recognition of the honors programs may induce more students to participate in these activities. Enrollment in the programs, however, has become less automatic and more reliant on student initiative. This initiative can be strongly influenced by academic advising, but the Committee believes that most faculty are largely unaware of the honors programs. The Committee therefore offers the following recommendation:

**Recommendation #2:** The College should institute a procedure to periodically educate the faculty at the department level about the benefits and requirements of the three honors programs.

**Regarding Charge #4:**

As a result of executing Charges 1-3, the Committee drafted two recommended charges for next academic year, listed above. Also, the Committee noted that the core curriculum for the College has not been seriously re-evaluated since the core was instituted over a decade ago. The College has changed significantly over the years, and the Committee is concerned that the core
may no longer be optimally addressing the College’s needs. The Committee therefore
recommends the following charge:

   Recommended Charge #3: Evaluate whether the current college core courses are still
   the best way to achieve their intended purpose.

The first two recommended charges are also repeated here for convenience:

   Recommended Charge #1: To consider whether it is pedagogically appropriate for
   introductory courses in Mathematics, Physics, and Chemistry to rely exclusively on multiple-
   choice questions in exams.

   Recommended Charge #2: Explore avenues to improve communications between the
   Curriculum Committee and the Department of Physics and Astronomy.

**Regarding Charge #5:**
Submission of this report completes Charge #5

Respectfully submitted April 1, 2013.