CCGB Meeting Agenda, May 15, 2009

1. Approval of minutes
2. Undergraduate announcements
3. Vote on approving new ENGRI course from MSE (Bland)
4. Vote on pilot introductory chemistry class (Baker, Estroff)
5. Vote on CCGB committee membership for next year (Fisher, Gries)

CCGB Minutes, May 8, 2009

Ex-Officio: K. Dimiduk, L. Schneider, F. Shumway, M. Spencer
Other: L. Estroff, B. Howland, M. Hutson, C. Pakkala, N. Peterson, J. Renegar

Approval of Minutes: The minutes of the 5/1/09 CCGB Meeting were approved as written.

Undergraduate Announcements: None

Not on agenda but discussed: R. Bland issued a statement in response to remarks that were offered at the end of our last meeting:

All faculty and staff associated with CCGB bring valuable experiences in undergraduate engineering education at Cornell, and exceptional commitment to the institution and its students. They come from different academic or administrative units, which facilitate sharing of information from differing perspectives. In my opinion, they do not act as parochial agents on behalf of a narrow constituency, but speak and act with broad institutional interests at heart. One is the faculty resident in a freshman dorm; that highly commendable contribution to student life at Cornell must certainly provide special insights into the student experience. Others bring other attributes to the table. Collectively, we have been showered with awards at the departmental, college and university level for teaching and mentoring undergraduate students. Two are Weiss Presidential Fellows, Cornell’s highest award for teaching and nurturing undergraduates. One of those was also recently chosen New York State Professor of the Year by the Carnegie Foundation. Another was praised in a unanimous proclamation of the Student Assembly for improving undergraduate life at Cornell. Some are alumni and bring the perspectives of former students as well as long-time teachers at Cornell, while others bring helpful perspectives rooted in undergraduate study, teaching, or administrative experiences at other engineering colleges.

To be sure, in this academic year we have not managed to make much progress on some important issues. As to which issues belong in that category, there is probably a consensus for some, but on others, their importance and timeliness may be in the eye of the beholder. Do we want to re-create Shef’s Curriculum Task Force from two years ago? CCGB, like most standing committees, has responsibilities that include both: major policy issues of broad impact, which, by their nature, require extensive consideration, deliberation and synthesis, as well as narrower issues that can be dealt with more quickly, and, in fact, usually, require prompt action. We must not use the urgency of the issues in the second category to hide from the bigger issues that loom. However, it seems to me that in the fall 2008 term, we often strayed from the agenda to address challenges to what should or should not be on the current agenda. Perhaps we need to consider mechanisms for setting future agendas and for non-CCGB faculty who have items for consideration to coordinate their requests through a CCGB faculty member.
Contrary to Michel’s sense of “symptoms of dysfunction” in such matters as the classification of the engineering communications courses under the liberal elective umbrella, I see that process as exemplary, not at all an exercise in “collective hand-wringing” or one that was “summarily thwarting thoughtful ideas.” The committee gave serious consideration to a proposal to use the Literature and Arts category for these courses and came to a 3 to 1 vote in favor. They presented both sides to the CCGB, which, in a straw vote, very narrowly opposed using that category. At the very next CCGB meeting, the committee returned with a proposal for a new seventh category in which the engineering communications courses would be placed. The CCGB enthusiastically discussed the committee’s new proposal, and by all appearances it will be adopted with only minor tuning. Kudos to Bill Philpot and his committee for carrying this forward in a very positive way, and pointing us toward an outcome that will serve our students well, and will avoid the appearance of placing the communications courses in a category that could have invited ridicule for being arbitrary. We may indeed need to assess the classification of some other liberal arts courses, but surely the need to maintain a web site that conveniently displays which of the hundreds of liberal electives are in which of 6 or 7 categories is neither burdensome nor a symptom of arbitrary classifications. OR&E deals with more than 300 students each year and we are experiencing less confusion about the liberal elective requirements than ever before, only 1 or 2 such inquiries this entire year.

The rapid evolution and great importance of engineering broadly, and of the subdisciplines that comprise it, present great curricular challenges. I hope that we can give them adequate attention in the next year. I agree with Michel that there is much to do in that realm. I have been at Cornell long enough to recall when the engineering core curriculum was a one-size-fits-all behemoth. There were 19 courses comprising 64 credits that every engineering major was required to complete – exactly the same courses, not choose one of two, or two of three, exactly the same 19 courses. There was some flexibility in the freshman year; it consisted of choosing Chem 107 and 108, or the more advanced Chem 115 and 116. A student who affiliated with Industrial Engineering (now OR&E) had an additional 9 required field courses (34 credits) with no flexibility; my recollection is that the other fields had comparable numbers of no-flex requirements. We have come a long way since then, and, mostly, with very favorable outcomes, but, clearly, the core will continue to evolve and it is our task to help lead that process.

I would like to thank all of those who contributed to CCGB this year, especially Betta, David, and Cindy. We should note that Betta has continued to serve as CCGB chair even after her term as MAE representative expired in December; she deserves special thanks.

Vote on approving new ENGRI course from MSE: R. Bland presented the following motion to the CCGB: The CCGB approves a new Introduction to Engineering Course, ENGRI 1140, to be offered by the Department of Materials Science and Engineering. The course title and description are: “Materials: Enabling the Future of Energy,” New technologies are urgently needed to fulfill projected global energy requirements. Materials properties typically limit the performance that can be achieved in generation, transport, and utilization of energy. This experiential learning course will explore how new materials can increase our energy supply and decrease consumption. Materials issues in photovoltaic, fuel cell, battery, wind, transportation, lighting, and building technologies will be studied. Through integrated lab-based activities students will develop a broad understanding of materials issues in order to successfully design and build an energy generation system. This description is comparable to what will go in the Courses of Study. This course should be quite exciting for undergraduates who can take this. L. Pollack said that she hadn’t had a chance to bring this proposal to her department. She is not sure how this will fit in with other ENGRI courses. She sent an initial email to her colleagues within AEP, and some of them responded that they have concerns about this course, especially its use of lab space, but that there wasn’t time to fully address this topic. Some
faculty members have questions about it. E. Fisher said that a vote on the motion would be postponed until 5/15 so that people could circulate the motion within their departments and obtain some feedback.

**Discussion of pilot introductory chemistry class:** S. Baker presented a motion for a proposal to NSF to develop a pilot introductory chemistry class for engineering students. Chemistry is becoming increasingly important for our students, and they need a good one-semester course. Because it is taught to a wide range of students across campus who do not have and are not expected to get sophisticated math skills, freshman chemistry is explicitly structured to include only those topics that do not need mathematics. Thus Engineering’s request to Chemistry to teach CHEM 2090 more quantitatively does not make sense. CHEM 2090 doesn’t instill quantitative concepts that can be used in other courses. The proposal is for Engineering to develop a pilot course in chemistry for engineering students. It would incorporate engineering math by linking to topics taught in MATH 1910. Topics would then be selected to provide quantitative skills in chemistry.

S. Baker and L. Estroff have drawn up a proposal for NSF to support the development of this. The deadline is in about 2 weeks. NSF would provide support for materials, tools, assessments, etc. The difficulty of providing a good chemistry course for engineers is a widely acknowledged problem but not widely solved. There are about 5 other schools that have developed courses like this. There is a lot of interest but not a lot of implementation. We need to think about how this course fits with the CCGB principles. The Curriculum Task Force discovered that we are interested in fundamentals and developing problem-solving skills. Baker and Estroff haven’t yet spoken with people in the Chemistry Department about this. We would like to develop course content; ultimately the course might be taught by Chemistry.

The proposed course will assume MATH 1910 as a co-requisite. The course content will provide a fundamental basis that would allow students to build their chemical intuition in any application area. It will be a free-standing, one-semester course, and an integrated lab will be designed to accompany the course. It would be offered as a pilot course during fall 2010. The experience of the students will be compared with that of the CHEM 2090 students beginning in spring 2011. The course will be evaluated and a decision made of how to proceed. The course content and style must serve the college, so the CCGB should be involved in making decisions regarding it.

**Motion:** CCGB approves the proposal by Estroff and Baker to develop a first year chemistry course for engineers with the expectation that the course will be offered as an experimental pilot project in Fall 2010 to a subset of engineering freshmen in lieu of CHEM 2090. The CCGB will see and approve the course content prior to the course being offered. The course performance will be evaluated and future plans for teaching of freshman chemistry will be determined no later than spring 2013.

F. Shumway asked if the course would be given in addition to CHEM 2090. S. Baker replied that the proposed course would not replace CHEM 2090. F. Shumway said that she sees this proposed course as helpful from a scheduling standpoint because it has been difficult to obtain enough slots in CHEM 2090 for those who need it.

L. Pollack said that she is concerned that if a student takes this instead of CHEM 2090, the student will still be able to take CHEM 2080. For students that want to get into areas that need both CHEM 2080 and CHEM 2090, they need to be able to get into CHEM 2080. L. Estroff agreed that this is an issue, but designing a 1-semester stand alone course would be very beneficial for those students that need only 1 semester of chemistry. L. Pollack said that she likes the math pre-requisite for the course very much. This replacement makes sense.
L. Pollack is concerned about the course utilizing space in Duffield Hall because an ENGRI lab course was moved out of Ward Hall to make room for faculty offices. The ENGRI people are floating around in Duffield with the promise of space in the new building by Clark Hall. She wants to make sure that space is considered.

E. Fisher said that the CHEME major requires two semesters of chemistry. F. Shumway said that the pre-med students require two semesters. J. Cisne said that EAS requires two. W. Philpot said that CEE requires another course, but not necessarily CHEM 2080. M. Walter said that BEE requires two chemistry courses, not necessarily CHEM 2080. L. Estroff said that hopefully this would be a proper course to lead to other ones, including organic chemistry. This won’t preclude students taking other chemistry courses in the future. K. Dimiduk said that there are specific courses the pre-med students need to take.

A. Ruina said that there are three issues: (1) The pre-requisite chain. (2) This course would need to serve as a replacement for CHEM 2070 or CHEM 2090. (3) Even if this is done cooperatively, it would be better to morph CHEM 2090 than to invent a whole new parallel class. Why did it take so long to develop this replacement class? K. Dimiduk said that we can’t morph CHEM 2090 because we would have to ask Chemistry to completely change CHEM 2080 and CHEM 2070. Doing this course as a test would be a good idea. We need to be able to feed into CHEM 2080 from this.

M. Louge said that the idea seems sound, but wonderful ideas require resources. The number of faculty members is decreasing and not much space will be available. It is great to do an experiment and have funding to do it, but we need to think of the steady state. Students have complained about a quantitative lack in chemistry. This course will draw a large number of resources, removing money from Chemistry that Engineering used to provide. In the long-term we will need labs that resemble Chemistry’s that will require resources.

S. Baker said that this is not thought of as the course that replaces CHEM 2090 in the future. We want to develop curriculum ideas in this pilot course to answer the question that Chemistry posed: “What should be in a one-semester introductory chemistry course for engineers?” We don’t have the ability to tell Chemistry to do this. This experiment forces us to talk to colleagues and find out what they need and make a suitable 1 semester course. The CCGB will decide if this is successful. M. Louge said that if a decision is not made about who is responsible for teaching this course, it will be difficult for the college. S. Baker said that L. Estroff will teach it 3 times and the CCGB will decide who teaches future classes.

We need to decide if this is reasonable direction to go in. This should be a CCGB project. M. Louge said that he thinks we should get the Chemistry Department to do this. E. Fisher stated that she is hearing that resources and logistics are important. There are also positive comments about the course content. Despite that, the CCGB is not ready for a vote on the motion. She requested a motion about the course concept and proposed that it be voted on at the next CCGB meeting.

S. Baker said that the immediate question is whether they should continue to try and develop the NSF proposal. If fundamental flaws exist, they need to solve them. Pollack said that money for TAs should be included in the proposal. K. Dimiduk suggested that web design also be put into the budget. R. Bland stated that he is enthusiastic about the content. He also asked people to keep in mind that the fall semester of CHEM 2090 has 500 students. This would help address the degradation of CHEM 2090. M. Duncan said that he doesn’t see a problem with TA availability because he has seniors in CHEME that could do this.
E. Fisher asked for a straw vote on the motion. There were 8.5 votes in favor, 0 votes against, and .5 abstentions. S. Baker agreed to keep plugging away at this and requested that people come back with concerns on 5/15. He doesn’t want this undefined in some way. The CCGB should take some ownership with this. A clear motion with clear and constrained guidance would be good. E. Fisher requested that any changes to the motion be sent to her. She asked everyone to discuss this issue with their departments. S. Baker agreed to circulate the motion.

**Update on “Streamlining Curriculum” task force, and input from CCGB members:** J. Renegar said that the task force came from the directive of the provost and is driven by the 2011 budget year. Big budget decisions need to be made in the fall. The task force came from the directive by the Provost and is driven by planning for the FY11 (2010-2011) budget. Provost Fuchs has asked for a report from the Colleges by July 1 about how they will make a possible 15% reduction in their budgets. Dean Ober has set up 6 task forces, each led by a Director or Chair, to review various areas of the College. One of them is focusing on “Streamlining the Curriculum.”

The committee met on Monday and brainstormed. They need to make decisions as quickly as possible. It is crucial that departments and majors have a chance to respond to suggestions. They are working with enrollment data this week. It is hard to compare majors against each other with regard to how they utilize resources. Jim Renegar recommended that a computer model be built to incorporate all of the major requirements. It should include both students’ affiliations and where they came from. We need to look at efficiencies. A model might highlight inefficiencies. We won’t get good responses until the beginning of the fall semester. We need to eliminate or merge redundant courses. It will be a two-step process: building and populating a model and then engaging faculty in the fall. The committee is unclear about how to create an incentive structure in the college to combine courses because courses justify faculty lines. Departments will be reluctant to relinquish or combine courses.

M. Louge said that the committee needs to talk about efficiencies and resources. Eliminating courses just moves them, but faculty salaries still need to be paid. The only efficiency is to eliminate visitors. Departments with a large reliance on visitors will suffer the most.

J. Renegar said that there is a strong argument that things are already very efficient. We need to make a case in the context of what the provost has requested. A. Ruina said that an incentive structure is key. If you want things to happen you can legislate them, but an incentive system is key.

J. Renegar said that CEE, ORIE, and MAE will be hit the most by retirement. Departments can decide if they want to offer incentives for early retirement.

The meeting adjourned at 9:02 a.m.