MINUTES of MECHANICAL ENGINEERING ADVISORY BOARD

Spring 2005 Meeting

Thursday April 28, 2005

Present:

Peter Avitabile (UML), Tim Byrd (Byrd Technology Group), Larissa Gorbatikh (UML),
John McKelliget (UML), Charles Nigzus (Parker-Hannifin/Nichols Aircraft), Lisa Pepi
(Gillette), Charles Roche (Pratt&Whitney), Peter Rock (GE Aircraft Engines), Sammy
Shina (UML), Bob Sletten (Tyco Electronics), Hongwei Sun (UML), Gary
Wenger(Cisco Systems).

1. Approval of Minutes

The minutes of the Fall 2004 meeting were unanimously approved.

2. Elections

Charles Roche, Chair of the Board, announced that he was retiring from the advisory
board to concentrate on high-school recruitment for the college of engineering. The
Dept. Chair, Prof. McKelliget, thanked Chuck for his many years of service and his
attendance at virtually all of the meetings.

Charles Nigzus (Vice-Chair) was unanimously elected Chair of the advisory board.
Tim Byrd was unanimously elected Vice-Chair.

2. Department Update.

Professor McKelliget reviewed developments within the department since the last
meeting in Spring 2004.

Faculty: The Department currently has 12 faculty, although one of these (Prof.
Charmchi) is currently on sabbatical. A new Associate Professor, Chris Niezrecki, was
hired last semester, and two, new, assistant professors (Larissa Gorbatikh, and Hongwei
Sun) started in January 2005. We currently have 1 courses being taught by an adjunct.
**Machine Shop:** The Dept. was able to hire a ½-time machinist, Bob Ladebauche for the Spring semester. We hope to take him on full-time in the Fall. Renovations to the machine shop are complete. A $10,000 dollar gift from Raytheon was matched with department funds to install a new ceiling and lights, and a full paint-job. Two milling machines and a lathe were donated by Abbott labs.

The Society for Automotive Engineers is constructing an SAE formula car in the machine shop. The department has committed $5000 to initiate the project. This is a good project for recruitment and outreach.

**Enrollment:** We currently have 224 undergraduate students and 50 full and part-time graduate students. At the last count we had 81 pre-paid freshmen for next fall. There are currently 74 freshmen, 57 sophomores, 52 juniors and 41 seniors. There will be 26 graduating seniors this year.

**Advising Update:** This semester ISIS (Inter-Campus Student Information System) became operational. This is a Web-based interface to the Peoplesoft student records system. For the first time ever we will have automatic pre-requisite checking. The transition seems to have gone fairly smoothly. One bug in the system is that, on the student side, courses are referred to by a code number that is unrelated to the traditional course number.

3. **Prof. Gorbatikh Research Interests.**

New faculty Prof. Larissa Gorbatikh presented some of her research interests and past projects to the Board.

4. **Prof. Sun Research Interests.**

New faculty Prof. Hongwei Sun presented some of his research interests and past projects to the Board.

5. **Proposed College-Wide Doctoral Programs**

Prof. McKelliget outlined a proposal to convert departmental doctoral programs into college-wide doctoral programs, as a means of pooling resources and consolidating graduate numbers.

The situation now is as follows:

- D. Eng. in Electrical Engineering
- D. Eng. in Plastics Engineering
- D. Eng. In Mechanical Engineering – with options in Civil Engineering and Chemical Engineering.
- No Ph. D in any department
ME department faculty held meetings to discuss the proposal, and the following issues were raised.

- Nobody (students, faculty, and employers) know what the D. Eng. is.
- There was strong support for a Ph. D. program
- Because of lack of a Ph.D. it was felt that we loose potential applicants
- Research funding levels are much higher now than when the D.Eng was introduced 25 years ago.
- If we call ourselves a research university we should have a Ph.D.
- In the inter-collegiate Nano and Bio programs we are not equal to the other college (A+S) which does have the Ph. D. degree.
- Lack of a Ph. D. distorts the D.Eng. degree since faculty treat the D.Eng as a Ph.D. The original intention of the D.Eng. (a professional degree) has been lost.

The ME faculty are proposing a motion to the effect of:

“...The faculty of the department of mechanical engineering proposes the establishment of college-wide D.Eng. and Ph. D. degrees within the College of Engineering. The doctoral candidate (in consultation with their doctoral committee) would have the option of focusing either on professional practice, and registering for a Doctor of Engineering degree, or on basic research, and registering for a Doctor of Philosophy degree.”

A discussion ensued. There seemed to be general support for the proposal from the Board members. They raised the following specific points:

- Generally industry does not care whether applicants have a Ph.D. or a D.Eng. as the qualities of every applicant are considered on a case-by-case basis.
- A doctoral degree in engineering sounds a little stronger than a doctoral degree in mechanical engineering, as it is more interdisciplinary.
- Internationally, the Ph.D. degree has more name recognition than the D.Eng.


Prof. McKelliget attended the ASME Education Conference. The Powerpoint presentations, and streaming video are available at

www.asme.org/education/DH/me2005/index.htm

Globalization. The primary topic addressed at the conference was globalization and the future outsourcing of engineering jobs. Students should start to think globally. There will much greater competition for work.

Board members made the following comments:
• Manufacturing is currently focused in China, while some design work was being sent to India.
• One board member has already seen examples of US based engineers lowering their costs (wages) to attract work back from overseas. This could result in a drop in engineer’s salaries in the future – and might make it harder to attract students into engineering.
• Board members who had been involved with outsourcing to foreign engineers abroad noted that there were still considerable communication problems involved, and that US engineers are more creative generally.
• 5-years ago all the talk was about Mexico, which is now too expensive. The same is likely to happen with China and India.
• It can work both ways – Toyota now has more US employees than GE.
• Mechanical engineering is very interactive. We need to teach our students to be able to think, to be creative, and to have confidence.

**Proposed Changes to ABET.** ASME is proposing to change part of the ME specific program criteria.

Old ME program criterium;

“The program must demonstrate that graduates have knowledge of chemistry and calculus-based physics with depth in at least one. The ability to apply advanced mathematics through multivariate calculus, differential equations, statistics, and linear algebra. The ability to work professionally in both thermal and mechanical systems areas including the design and realization of such systems.”

Proposed new ME program criterium;

“The program must demonstrate that graduates have the ability to apply principles of engineering, science, and mathematics, including calculus and differential equations, to analyze, design, and model physical systems; and are proficient in both thermal and mechanical systems areas”

The proposed change is more in-line with the EC2000 philosophy of letting the institution define its’ own program. It also avoids the confusing phrase “ability to work professionally in”. This ability is generally obtained or perfected in on-the-job training, rather than in school.

There is also a move on to permit accreditation at both the graduate and undergraduate level in the same department. This might affect us in the future, since the University requires accreditation for all programs for which accreditation is available.

A postmortem was held on the advisory board evaluation of last year’s capstone projects.

Board members said that the layout and content of the evaluation form was good. They universally agreed that the sound quality on the videotapes was terrible. We will put the microphone closer to the presenters next time. The board members were very positive about the level of Capstone project and the ability of the students.

Based on further Board input, Prof. Shina wrote the following additional guidelines for capstone faculty:

Additional Capstone Presentations and Report Guidelines

We have just concluded our regular meeting with the Industrial advisory committee that will audit our capstone reports and presentations for this academic year 2005. Their comments about last year capstones, which they audited by studying the videotape of the presentations and the CD of the reports were mostly positive, but they expressed their wishes for you to clarify your capstone projects more precisely as follows:

1. **The scope of the capstone projects:** the advisory board members would like all capstone presentations and reports to clearly outline each project: What are the expectations? What was achieved? What part of the capstone effort was specifically accomplished by this semester students? What was the foundation of the effort on previous work? And what recommendation for further work to be done by future capstones?

2. **Specific Use of Class materials:** The advisory committee would like to see the students apply basic engineering knowledge by using examples of specific instances of mathematical calculations based on class materials and equations.

3. **Choice of Design alternative:** The advisory committee would like to see a discussion of what other design alternatives were considered and why a specific final choice was made.

4. **The use of Time Management in the presentation:** The advisory committee has asked us to strictly enforce the time limitations in order to force the students to better manage the time allotted for the presentation (7 minutes per students)

Please be mindful of those comments and apply your reports and presentation accordingly

Thank you

The meeting was adjourned, and Board members went on a tour of the renovated machine shop and baseball lab.