MINUTES of MECHANICAL ENGINEERING ADVISORY BOARD

Spring 2004 Meeting

Thursday April 29, 2004

Present:
Doug Browne (Abbott Labs./Medisense), Dick Driscoll (3M Touch Systems), Jack Dunfey (Retired), Mike Kizner (Raytheon), John McKelliget (UML), Charles Nigzus (Parker-Nichols), Charles Roche (Pratt&Whitney), Leo Lambert (EPTAC Corp.), Sammy Shina (UML), Gary Wenger (Cisco Systems), MESAC members.

1. Approval of Minutes
The minutes of the Fall 2003 meeting were approved.

2. Department Update.
Professor McKelliget reviewed developments within the department since the last meeting in Fall 2003.

New Board Member: Prof. McKelliget welcomed a new Board member, Jack Dunfey, a graduate of the class of ’69, and now retired. Jack is the sponsor of one of the department’s scholarships. Jack described his career to the Board.

Faculty: The Dept. currently has 9 faculty members. Profs. Robertson and O’Callahan retired in December 2003. Prof. Chen will be returning from her leave of absence as a Program Director at NSF in Fall 2004. The Dept. is currently searching for 2 new faculty members, and it is possible that a third faculty member will be hired under the nano-technology initiative. Retired professor Kenneth Rogers recently passed away.

Laboratory Issues: The Baseball Research Lab is being moved from the sub-basement of Pasteur to the basement of Kitson. It will occupy space currently assigned to the Composites Lab and part of the Machine shop. It is intended that the increased visibility will help with recruitment. The move is coming from non-departmental funds. The Solar Energy Lab has been moved to new space on the 4th floor of the Engineering building.

The machine shop is still without a full-time machinist. The lathes are old and we will gradually start to replace them. Mike Kizner (and Mark Russell at the College Advisory Board) said that Raytheon might be able to provide some funds to help with this. Mike also remarked that there were a number of retiring machinists at Raytheon who might be willing to work part-time. Doug Browne (Medisense) announced that Medisense were moving to the West Coast and that some equipment from their machine shop might become available.

Enrollment: Enrollment still continues to climb. We currently have 280 undergraduates and 60 graduates. We will graduate about 40 undergraduate students this year. We are expecting between 70 and 80 new students next Fall.
3. **Student Advisory Council.**
Prof. McKelliget explained that a new mechanism for obtaining student feedback has been initiated. Previously, student representatives met directly with the Advisory Board, who then relayed the student’s comments to the faculty via the Dept. Chair. The Dept. Chair then produced a faculty response, which was subsequently relayed to the students via the Advisory Board. It was felt that this procedure was unnecessarily complicated. Following the example of the Civil Engineering department a student advisory council (MESAC) has been formed in the ME department. The original impetus for this change came from the Dean of Engineering, who was previously Chair of the Civil dept. Their student council had received very positive reviews during the last ABET visit.

The Council is composed of approximately 2 students from each year, and two from the graduate program. The Chair of the department meets directly with the Council two or three times a semester. The Chair then follows up directly with the faculty, and reports back to the Council. Representatives from MESAC are invited to attend the MEAB meetings.

4. **Business Administration Minor for MEs**
A new minor in business administration for ME students has been developed. Prof. McKelliget reminded the Board that a generic management minor has existed for a number of years. He also reminded the board that minors are offered, and administered, by the department offering the minor. Having said this, the College of Management has agreed to let engineering students satisfy some of the management courses with management-based engineering courses. The minor has the following structure.

**Required Courses:**
- 49.201 Economics I (already in ME curriculum)
- 60.201 Accounting/Financial
- 61.301 Business Finance
- 62.201 Marketing Principles
- 66.301 Organizational Behavior

**Elective Courses:**
- 22.576 Engineering Project Management
- *one* from the following list
  - 14.372 Civil Engineering Systems
  - 14.470 Engineering Economics or 10.409 Economics & Process Analysis
  - 26.542 Business Law for Engineers

400 or 500 level engineering courses in the minor may also count as technical electives in Mechanical Engineering.

Board members were generally receptive to the idea.
5. Service Learning Integrated throughout the College of Engineering (SLICE).

Professor Duffy described a new college-wide initiative, funded by NSF, to integrate service learning projects into a number of required engineering courses. Studies have shown that service learning can help students learn better. It can also help with recruitment – especially among women and minorities.

UMASS Lowell is already a national leader in service learning – with the ECE department Assistive Technology Program, and ME’s PERUML project. What is new about this proposal is the inclusion of service learning in required engineering courses. He reminded the Board that ABET requires both interdisciplinary teamwork, and an understanding of the impact of engineering designs on the environment and on society. He thought that Industry could play an important role in helping out with projects and with financial support.

A general discussion followed. Board members were supportive, although there was some concern that technical content might get watered down. It is important that the projects remained technical in nature rather than “touchy feely”.

One of the student members felt that the project-based learning experience was very useful. It allowed students to discover things themselves, rather than being spoon-fed the information. Projects enhance team and people skills. He recommended that students be allowed to vote on the degree of participation of other students in the group.

6. Industrial Projects and Consulting Center.

Prof. McKelliget described a draft proposal by Prof. Charmchi to form an Industrial Projects and Consulting Center. Industrial members would pay an annual membership fee in exchange for some free consulting services, and access to departmental laboratories.

The model was already working at a number of universities. One of the Board members has a similar setup with the University of Hartford, and describes it as a win-win situation. At Hartford it was set up independent of their research foundation.

Some Board members seemed interested, but raised a number of issues that have to be addressed, such as software licensing, and non-disclosure agreements.

It was agreed that a more detailed plan was needed.
7. ABET Outcomes and Objectives

Prof. McKelliget informed the board that the department faculty had just completed a major overhaul of the program’s educational objectives and outcomes. Copies were distributed to the Board members.

ABET has defined outcomes as the stuff that students know at graduation, and objectives as the things that they should be able to accomplish in their careers. Outcomes should be designed to support the achievement of the objectives. Prof. McKelliget felt that, while the faculty had a good handle on defining the outcomes of the program, the Board members were specifically well-suited to provide feedback on the objectives.

He posed a number of questions to the Board members.

- In what ways does the undergraduate education help students to become successful engineers?
- What other things do they learn after graduation that helps them achieve success?
- How come many students that perform poorly in the program become very successful engineers?
- Are we teaching the right stuff?
- How can we assess whether students are achieving our objectives?

A lively discussion of all questions followed. The following important points were made by Board members.

- What exactly do we mean by success? Most engineers did not go into engineering just for the money.
- Sometimes there is a trade off between technical competence and creativity.
- Grades may not measure creativity.
- Grades only matter once – for the first job.
- High grades are well suited for research – but this is only a small part of engineering.
- g.p.a. cannot tell you what a student will achieve after graduation.
- Ability to get along with people is very important.
- People expect MEs to know everything.
- Companies like it that our grads have a lot of hands-on experience.
- Flexibility, creativity, communication, people skills, and technical competence are all important.
- Need to develop the thinking process at college.
- Having a senior engineer mentor is very useful for graduates out in industry.
- When companies evaluate the performance of their employers there is always more than one component to the evaluation – technical competence is just one factor.
• If companies come back and keep hiring your graduates then you are achieving your objectives.
• 3M hires a lot of UML graduates.
• Send out company surveys – target job fairs.
• See what companies consistently return for job fairs.
• Collect data on technical patents of graduates.
• Ask graduates if they would choose to go to the ME program at UML again. Would they be happy sending their children to this program UML?
• It seems apparent that increased project work in courses would enhance the educational experience of many of our students.

The meeting was adjourned at 4.00 p.m.