MILWAUKEE SCHOOL OF ENGINEERING
B.S. COMPUTER ENGINEERING
INDUSTRIAL ADVISORY COMMITTEE MEETING
May 27, 2011

Attendees:

Prof. William Barnekow – MSOE CE Faculty
Dr. Russell Meier – MSOE CE Faculty
Dr. Darrin Rothe – MSOE CE Faculty

Mr. Ryan Barnett – MSOE Student Representative
Ms. Elyse Hobson – MSOE Student Representative
Mr. Alex Lurvey – MSOE Student Representative
Mr. Dmitry Tchaikovsky – MSOE Student Representative
Mr. RJ Wright – MSOE Student Representative
Mr. Kevin Zimmerman – MSOE Student Representative

Mr. Dennis Bergin – Plexus
Mr. Joe Izzo – Rockwell Automation
Mr. Tom Klein – Rockwell Automation
Mr. Tom Kraus – GE Healthcare
Mr. Mark Krueger – NVIDIA
Mr. Greg Treichel – Robert W. Baird & Co.
Mr. Leo Vinitsky – FedEx
Mr. Jeff Zingsheim – Honeywell

Welcome and Introductions – Given by Dr. Meier (MSOE) and Mr. Zingsheim (IAC Chair)

Program Information

- Meeting Minutes – Minutes from the October 22 meeting were approved.
- Student Statistics – Class size is expected to decrease, as our enrollment standards increase. Some of these new standards include: no more probation, all freshman being calculus ready, higher ACT scores, early intervention by advisors, and our “Week Zero”, which is used to prepare incoming students for college life at MSOE. Our target class size is 40-60 students and this fall we had 41 incoming students enrolled in the CE program. This year’s graduating class was 27. Overall retention is higher, specifically retention between the freshman and sophomore year and between the sophomore and junior year. Dr. Berry’s personal goal is to have a 90% retention rate (top tier) over the next 2-3 years.
  - Note: Student Statistic information handout is to be considered confidential.
  - Note: It would be nice to have this handout in color.
- Follow-Up to Fall Questions
  - Q: How do CE enrollments compare to UWM and Marquette?
    - A: We offer three main differences from competing schools. First, we offer direct admittance to the student’s major, whereas students have to apply to both the college and the individual school at MU and they do not start classes in the major until the 3rd year at UWM. Secondly, we offer the most engineering content through credits in the individual major. At MSOE, we have the most credits in the major. Our last major difference is class size. We offer smaller...
classrooms, eliminating the giant lecture halls, as well as strong mentorship because classes are taught only by professors without assistance from TAs.

- Q: What follow-up does MSOE take with accepted students who do not choose to attend MSOE?
  - A: Enrollment does follow-up with students who choose not to enroll. The largest factor seems to be with financial aid. Most students do not take the extra step of calling our Financial Aid office to determine what help is available to them.

- Q: What are your foreign student sources?
  - A: Besides our Lubeck, Germany program (which CE is unable to participate in due to a match in available courses), we now have three sources of program exchange.
    - Manipal, India – Students coming here are challenged because their curriculum in India is not spread out as much as the MSOE curriculum. Thus, transfer credits are harder to evaluate. Our courses are balanced across all four years with some content areas, like architecture and programming, spread through multiple courses. Transferring a Manipal class is tricky because their single or two-course sequence may be reduced compared to the content in some of our four or five course sequences.
    - Czech Tech – New program offered, in which our students travel there.
    - Saudi Arabia – Students from Saudi Arabia often attend MSOE. Our enrollment services staff tells us that that they are sent to MSOE by either the government of Saudi Arabia or a company in Saudi Arabia with the expectation that they will return and work in Saudi Arabia after finishing their degree.

  - Vinitsky: This is a great advancement.
  - Meier: It really helps to reduce ethnocentricity.
  - Vinitsky: Agrees and suggests deepening the programs, if possible, with more students moving both ways.

Review of Events - Recent

- JCI sponsored the CE event this spring. The CE event was organized to include polo shirts, a pizza dinner, a raffle drawing for prizes, networking opportunities, senior project showcasing and speeches from industry members. The event had a turnout of over 100 and student feedback was very positive.

- Plexus-sponsored 2nd Annual EECS Embedded Design Competition: This year’s theme was “Computers That Move.” Projects are on display today in the Schroeder Room. IAC members are invited to judge projects.
  - Students are given a bag of parts in December and work independently to create a project. Theme is open to interpretation. Teams who submit a final project are given a refund and winning teams receive a cash prize.
  - Students are free to ask questions, but are not required to check in periodically. The competition (open freshman through junior year) is comparative to the Senior Design Project, but without the mentorship oversight.

- Dr. Durant has finished his Executive MBA at the University of Wisconsin–Milwaukee.

Review of Events – Upcoming

- Recruiting
  - Open House dates are July 16, October 15, and tentatively December 3.
IAC members are invited to attend. It is a good opportunity to answer questions from parents and to bring demos.

- **Industry Forum for students** – (September 30 at 11am)
  - Forum is now department wide.
  - If you are interested in attending, please email Dr. Durant.
  - **Action Item:** Include tour of MSOE to IAC members, specifically EECS new labs and the new BioMolecular program.

- **CE Student Event in Fall** – Plans are underway. The event will be sponsored by FedEx and will take place on 9/26/2011.

- **IAC Meeting** – We are looking for a host for the Fall IAC meeting. Last year’s meeting was held at FedEx. If interested, please contact Dr. Durant. **If no one is interested, FedEx has volunteered to host again.**

- **Op Computer Competition** – This is a regional competition for high school students with a focus on computer science. MSOE hosts and students are judged on a series of tasks to solve in Java or C++. It takes place in November, generally the Friday before Thanksgiving Break.

- **IEEEXtreme Programming Competition** – IEEE is a professional organization and organizes this worldwide competition, which takes place in October. Students work overnight to solve a set of programming problems. MSOE did extremely well and placed at the top tier for our region.
  - **Action Item:** Can MSOE be sponsored locally? Dr. Durant will follow up with a reply to the committee.

- **Rockwell Collins** is sponsoring a student event in December and will provide tours of the facility.

- **FOCUS Programs** – Enrollment sponsors summer camps for high school students. It is a week-long camp in which students stay in the dorms and “focus” on a particular program. Students also go on industry tours. Last summer they toured Direct Supply and Astronautics. If you are interested in hosting a tour, please contact Dr. Rothe. SE/CE groups tend to average around 50 students at the sophomore/junior level.

- **Discover Program** – MSOE also features a summer Discover Program, which allows students in the 8th through 11th grade a chance to rotate through eight majors at MSOE.

- **Senior Design** – Prof. Barnekow, Dr. Rothe and senior Ryan Barnett described this year’s senior design projects. Senior Design teams for next fall are currently being formed. If you are interested in sponsoring a team, please email Dr. Rothe.

**Recent Changes**

- **FIRST Robotics** – New student group on campus. Originally a high school opportunity to introduce students to engineering, they are now featuring this group at the collegiate level. If you are interested in sponsorship opportunities, please contact Dr. Durant.

**Student Feedback – Junior and Senior debriefings**

- **Student Surveys** – This year, juniors and seniors were polled. We are thinking about changing the process to survey sophomores (at their half way point) and seniors (before graduation). A summary of this year’s key points is below:
  - **Ethics:** Too much focus on theory and not enough case studies.
  - **Workload:** There should be more presentations, specifically the addition of a project presentation during finals week for CE3910. Students also requested interviews between faculty and individual groups rather than formal group presentations.
  - **Social Impact:** Provide IEEE papers during lectures and find a cohesive place to add research material; provide links to outside sources and research
- **Version Controls**: Move from end of sophomore year to freshman year; need more exposure
- **Modern Equipment Usage**: Provide in every course (e.g. oscilloscopes)
- **Languages**: Provide more exposure to more languages
- **Report Requirements**: Be more clear
- **Modern Design Processes**: Put debugging into lower level classes
- **Peer Review**: Spend more time with peer debugging and peer review.

**Recent Developments**

- We had three new electives offered this year:
  - Wireless Sensor Networks
  - VLSI
  - Advanced Digital Design
- Discussion on System Issues. Response was to keep microcontrollers and continue to make introductions to FPGA/SPOC, such as Prof. Barnekow is doing in Advanced Digital Design and Dr. Meier is doing in CE4920.

**General Discussion**

- **Languages** – MSOE does not need to cover more languages. As long as the students have the tools to learn new languages, they can do so on the job or on their own.
- **Modern Equipment Usage** – Maintain exposure to hardware tools, so that students know what is available to them and how to use them.
  - We are starting a new facility plan, which includes lab replacement/updates.
  - **Action Plan**: Share Feedback from this IAC with other program directors on what technology to buy.
    - Keep oscilloscopes, logic analyzers, JTAG ICE, do not move just to a USB protoboard that plugs into the laptops
- **Presentations** – Do fewer formal presentations and more “pitch” presentations. Perhaps include simulation exercises.
- **Presentation Skills** – Students should learn quality tools in communication (e.g., fishbone diagram, multi-vote, etc.). These are effective when new grads are trying to persuade senior industry members. Twenty percent of industry is “young blood”, which brings in new technology, however they need to know peer-selling points. Good engineering practices can be applied to business applications.
  - **Action Item**: Give feedback to RSB for the junior year class on Business Development and Entrepreneurship.
  - **N.B. 7/31**: MSOE’s business school recently provided course materials showing that many of these topics are covered in the latest version of MS2220 (Foundations of Business Economics), which we require our students to take. Decision making tool coverage is based on current practices at Rockwell International and includes Force Field Analysis plus an assignment where students choose to focus on a topic such as fishbone diagrams, KPIs, and Pareto analysis.
- **Ethics** – It’s refreshing that students are bringing this up as a concern. They should be given more case studies that they can relate to and should be trained to ask “Can we do this?” It’s important that students understand that this is a regulated industry, open source code is NOT free, and that they are making legal decisions by using or not using a license. Students need to be aware of Federal laws. Consider a project where students have to evaluate the ethics of what they are doing.
- **Alumni Surveys** – We do ask for job functions.
  - **Action Item**: Provide incoming students with examples of what graduates are doing.
- **N.B.: 7/31:** Marketing is building an on-line database of student and alumni profiles. We have 3 alumni profiles, which will be added to our bulletin board near the faculty offices in the coming weeks.
  - Catch-phrase courtesy of Leo Vinitsky “Start your education with the end in mind.”
  - **Action Item:** Add an introduction to the patent process to the Entrepreneurship class.
- **N.B.: 7/31:** Confirmed that this is in the current learning outcomes.
- **Adjunct Faculty** – If you are interested in teaching part time, please contact Dr. Durant.

Meeting adjourned at 11:10am