Electrical & Computer Engineering Department
Industrial Advisory Board (IAB) Meeting Minutes
Friday, October 14, 2005


Faculty Present: V.N. Bringi, Chandra, Edwin Chong, Anura Jayasumana, Tony Maciejewski, Sanjay Rajopadhye, Steven Reising, H.J. Siegel

Guests: Gary Amato (CSURF), Jan Behunek (CSU Career Center), Lana Hoff (COE Marketing & Communications), Ann Malen (CSU Career Center), Aram Ossorio (HP), Debra Zimmerman (HP)

1. Introduction and Welcome (Debbie Goldman, IAB Vice President)
Debbie kicked off the meeting by welcoming 10 new members and visitors. Because so many new people were in attendance, Debbie asked everyone to go around the room and introduce themselves. She also explained the meeting theme and reviewed the day’s agenda.

2. Guest Appearance by Gary Amato (Director of Technology Transfer, CSURF)
Gary announced that RamBox, a series of controllers used to control onstage effects for theatrical productions, was officially licensed as a product. RamBox was designed and produced as part of an ECE senior design project.

3. ECE Department Update (Tony Maciejewski, ECE Department Head)
The presentation included the following topics:
   a. ECE researchers win NSF MRI award
   b. ECE & CSU reach all-time high for research expenditures
   c. ISTeC Hosted Future Vision 2010
   d. Dr. Sandy Woods named Interim Dean
   e. Randy Bartels wins GECCO Gold Medal
   f. EUV ERC students receive prestigious scholarships
   g. Sharmila Padmanabhan receives Young Scientist Award
   h. PEER hosted successful summer camps
   i. ECE ramps up graduate recruiting with launch of DVD
   j. Department to host reception to honor Dr. Aram Budak on October 15th
   k. IS&T Day for high school students and counselors set for November 4th
   l. Introduction of CSU Co-op Program
   m. Enrollment trends
   n. Undergraduate degrees awarded
   o. Graduate degrees awarded
   p. Proposal activity in terms of dollars
   q. Growing research expenditures
4. **Update on Action Items from Spring Meeting (Tony Maciejewski)**

Tony’s presentation provided an update on the following action items:

- **Action item**: Contact board to gauge their interest in the fall Student Advising Day and Graduate Study in ECE event.
  - **Status**: Department held Graduate Study in ECE event on 8/31; three members participated. ECE hosted Student Advising Day on 9/8. 11 companies were in attendance; received favorable feedback from ECE students.

- **Action item**: Begin polling incoming freshmen to see why they decided to go into ECE; continue to track their progress to better understand retention rates.
  - **Status**: Mechanism being incorporated into College’s overall recruitment and retention strategic plan.

- **Action item**: Send the board a list of available speaking dates and possible topics for the senior design class, asking them to either sign up for a talk or forward to the appropriate person within their company for consideration.
  - **Status**: Andrea sent list to the board; five IAB members scheduled to speak this semester on a variety of topics. Several others planning to speak in the spring.

- **Action item**: Encourage teaching the process and language associated with Six Sigma; try to get an industry representative to give a talk on the topic.
  - **Status**: Presented to board as possible senior design topic – no one yet has expressed an interested in presenting on the subject.

- **Action item**: Bring in a senior design speaker to talk about the importance of effective communication in a professional environment.
  - **Status**: Bob Gann with Hewlett Packard scheduled to speak on this topic in November.

- **Action item**: Ask Career Center to present the CareerRam tool at the fall IAB meeting.
  - **Status**: Ann Malen and Jan Behunek presented tool over lunch.

- **Action item**: Consider revising the senior design course to include an exercise that will help students improve their communication skills.
  - **Status**: Considering the idea of adding a “Best Paper Award” to the E Days awards ceremony. If anyone is interested, contact Andrea Leland (lelandam@engr.colostate.edu or 970-491-1033) for more information.

- **Action item**: Work with the Career Center to create a form that employers can complete after they interview an ECE graduate. This tool can be used to begin evaluating and measuring the strengths/weaknesses of our graduates.
  - **Status**: Holding as possible project for new Career Center liaison (interviews for new position currently under way).

- **Status of action item from previous meetings**: Programming courses added to ECE curriculum – broader range of options for students including C and C++

5. **Industry Spotlight: Northrop Grumman (Dave Henderson)**

Dave presented an overview of Northrop Grumman, including the company’s history, their organizational structure, and examples of their major projects.


Debra and Aram presented a recap of the Future Vision 2010 event held on Sept
9, 2005. They provided background on the conference and details about the planning process. Debra and Aram encouraged the board to continue working together with the ECE department to help prepare our students for the future of engineering.

7. **Roundtable Discussion regarding the book, Engineer of 2020 (Lana Hoff, Director of Marketing & Communications for the College of Engineering, facilitated the discussion):**

Questions posed:

1. Based on your knowledge of the current engineering climate and the predictions for the future outlined in this book, what steps should be taken to create a learning environment that addresses the changing face of engineering? If you could start with a blank slate, how would you design an engineering curriculum?
2. How do we determine who should be an engineer? How can we reach the right students early on in their education (K-12) and encourage their pursuit of engineering?
3. What will (or should be) the relationship between industry and universities in terms of research collaboration, continuing education, etc.?

**Key points discussed by the board:**

- Alan Meyer feels that the current engineering curriculum should be expanded to include additional courses in order to meet the needs of the future. He noted that this would be nearly impossible to accomplish as part of a four-year degree.
- The group discussed the fact that higher degrees are encouraged in the book, yet companies are snatching up students as soon as they graduate with their bachelor’s degree, and students may feel that there isn’t an incentive for them to consider continuing their education. They learn how to perform a specific job for a specific company, and often their skills aren’t transferable to another organization or industry, should they decide to leave their position.
- The board talked about the idea of providing continuing education courses for industry professionals and people looking to broaden their skills and knowledge.
  - Warner Andrews suggested the idea of a seminar series to provide a forum for practicing engineers to brush up on their skills. He wondered if industry would be willing to sponsor such an event.
- Tom Williams touched on the dramatic decline of foreign-born graduate students and how the U.S. relies on them. He believes this is a systemic issue that shouldn’t be overlooked. He also mentioned that outsourcing to cities such as Bangalore, India, is growing at a phenomenal rate.
- In discussing the curriculum, the board agreed that the department can’t abandon the core basics (e.g., math) that teach students the essential problem-solving skills needed in any engineering environment.
- Hai Ho shared three key areas that he believes will be of interest for future engineers: 1) analog electronics; 2) cross-discipline systems engineering; 3) business savvy.
• The board commented that the expectations of engineers are higher than they used to be and that will continue to be the case – they are expected to be leaders as well as technical experts with a broad scope of knowledge.
• Members touched on the senior design course and the ongoing importance of that experience. They noted that learning to work in a team, communications, setting schedules, problem solving, etc., will always be essential.
• The group posed the question: Should we remove humanities from the engineering curriculum to free up more time for core engineering and technical courses? For the most part, everyone agreed that engineering students can also benefit from the humanities courses.
• A few people mentioned the idea of expanding the graduate educational experience to be broader and all-encompassing instead of narrowly focused on one discipline/area of emphasis.
• In order to encourage engineering among K-12 students, several people recommended doing more to engage grade school and high school students in the senior design process.

Summary of discussions:
• The board did not recommend any major changes to the ECE undergraduate curriculum; the department should not abandon the core fundamental courses.
• The department should look at providing a wider range of opportunities through continuing education, blurring the lines between the university and industry.
• Through the senior design course, ECE can continue to collaborate with industry and encourage the pursuit of engineering among K-12 students. The department will continue to approach the board for ideas and suggestions in this area.

ACTION ITEMS:
• Present statistics at next meeting on the ECE faculty’s peer-reviewed papers and citations.

• Consider ways to provide a broader range of continuing education opportunities for industry. For example, a special seminar series (perhaps sponsored by industry).

• Continue to encourage industry involvement in ECE education such as giving talks to the senior design class, serving as adjunct faculty, participating in student activities, collaborating on special events, etc.

• Follow-up on the idea of adding a “Best Paper Award” to the E Days awards ceremony.

Please mark your calendar for the spring IAB meeting on Friday, April 14, 2006. The meeting will be held in conjunction with Engineering Days.