IAB members present:

ECE faculty and staff present:
Bob Bower, Tom Chen, Edwin Chong, Anura Jayasumana, Kevin Lear, Andrea Leland, Tony Maciejewski, Olivera Notaros, Sid Suryanarayanan, Ron Sega, HJ Siegel, Liuqing Yang, Peter Young.

Guests:
Mike Freeman, CFO, Fort Collins Economic Development; Terry Comeford, Career Counselor, CSU College of Engineering; and a group of ECE undergraduate and graduate students.

1. **Introduction and Welcome (Jim Greener, IAB president)**
   Jim opened the meeting by welcoming new members and guests.
   - **New members:** Scott Evans, Arrow; Sarah Hay-Arthur, Woodward; Dennis Wallisch, Anheuser-Busch; and Brett Wangen, Western Electricity Coordinating Council
   - **Guest:** Hongming Zhang, Western Electricity Coordinating Council

2. **Department Update (ECE Department Head Tony Maciejewski)**
   Tony’s department update addressed the following topics:
   - **Faculty News**
     - New faculty in lasers, optics, and applications:
       - Dr. Sandra Biedron, Associate Professor
       - Dr. Stephen Milton, Professor
     - Drs. Mario Marconi and Randy Bartels named Fellows of the IEEE
     - Dr. Jorge Rocca receives Arthur L. Schawlow Prize in Laser Science
     - Dr. Bartels receives highly competitive $1M Keck Foundation grant
     - Dr. Reising wins $3.2M grant to develop airborne radiometer in advance of future NASA mission
     - Dr. Chandra and CASA Engineering Research Center featured in New York Times for its system to speed up forecasting tornadoes
     - Dr. Siegel secures NSF grant for high performance computer
     - Dr. Chong receives Distinguished Member Award for IEEE Control Systems Society
   - **Student News**
     - Graduate student Rongjin Yan honored by Chinese Government
• Senior Ryan Friese received Top Scholar-Athlete Award
• ECE students Matt Duwe and Ryan Selby reach out to local high school students as part of NSF GK-12 grant
• Agilent donates new equipment for digital circuits laboratory
  o Special thanks to IAB member Dan Ferguson!

**Graphs and charts**
• COE trends in research expenditures (including FY10-11 projection)
• Distribution of College of Engineering research expenditures (FY10-11 projection)
• Trends in ECE research expenditures (including FY10-11 projection)
• National engineering enrollment trends
• ECE spring enrollment
• Undergraduate degrees awarded
• Enrollment trends by class
• Freshmen enrollment trends
• Admissions outlook
• Graduate degrees awarded
• Percentage of international degrees awarded

**National ECE Statistics**
• Are electrical engineers happy?
  i. Only 13% completely content with job, according to EE Times Poll
  ii. 48% of Americans completely satisfied with job, according to Gallup Poll
  iii. Engineers nearly 4 times less likely than the average American to be completely satisfied with job
• Bigger Paychecks for ECE Grads
  i. Average starting salary for electrical engineering graduates up 4.4% from 2008
  ii. Average EE starting salary = $61,690 (highest starting salary among all engineering disciplines)

3. **Update on Fall Action Items**
   At each meeting Tony gives progress updates on notable suggestions from previous board meetings. He reported on the following action items from the FA10 meeting.
   • **Action item:** Continue working with Math department to get mathematics courses for engineering students taught by regular faculty (not TAs).
   • **Status:** ECE submitted a formal memo to the Math department, suggesting that for each course in the calculus sequence they offer one large lecture section (about 60) exclusively for ECE students taught by one of their gifted professors. The Department Head was extremely receptive, but the idea hasn’t yet been implemented. We will report back next semester.
   • **Action item:** Leverage existing strengths in systems engineering to build new partnerships.
   • **Status:** Drawing on successes of systems engineering to develop a new distance education program. Curriculum will be compatible with systems distance program.
   • **Action item:** Host seminar series and use as a marketing tool to increase industry interest and awareness of ECE’s research work.
   • **Status:** ISTeC seminars publicized to IAB. CREW series launched.
   • **Action item:** More student involvement with industry, e.g., field trips, senior design sponsorship, internships for freshmen and sophomores.
• Status: All internship opportunities shared with underclassmen. IEEE Design Competition enlisted industry support for student projects at all levels.
• Action item: Work to expand and improve internship program.
• Status: Wolf Robotics has been effective in establishing a successful internship program. Contact Andrea if interested in improving your company’s program.
• Action item: Make IAB contact information available to all members to help build personal connections and networks.
• Status: Added LinkedIn profiles to IAB web page. Most members are connected via LinkedIn group.
• Action item: Offer ECE lab tours for interested board members at a future meeting.
• Status: Agenda full for spring. Are board members interested in doing this in the fall?
• Previous action item/Tiger Team initiative: Refurbish ECE student lounge to improve morale.
• Status: Proposal approved by University Facility Fee Advisory Board. Impressive student involvement in securing funds.

4. Industry Spotlight: Vaisala (Chuck Quire)
Chuck provided an overview of his company, Vaisala Corporation, a global leader in environmental and industrial measurement, serving customers in meteorology, weather critical operations, and controlled environment markets. Vaisala employs approximately 1,350 professionals in nearly 30 offices worldwide, and its products are used in more than 140 countries. Chuck works in R&D, an area that plays a significant role in the company. He infused humor into his presentation, and noted that he just received approval to hire an intern. He hopes to find a CSU student to fill the position.

5. Senior Design Presentations – Two teams of students presented their senior design projects to the board:
   ○ Upper-limb stroke rehabilitation
     Team members: Nick Brantey, Celia Pietsch, & Ethyn Feldman
     Advisor: Dr. Sudeep Pasricha
   ○ Environmental Sensor Network (1st place winner at the 2011 E-Days competition)
     Team members: Kyle Latham, Benjamin Vacha, and Andrew Durbin
     Advisors: Dr. Kevin Lear, Dr. Vicki Campbell, Jarrod Zacher, and Olivera Notaros

6. Expanding Local Chip Design Sector (Mike Freeman, CFO, Fort Collins Economic Development)
Mike is working with the City of Fort Collins, local chip companies, the IEEE, and other stakeholders to reinvigorate the local chip design sector. He asked the board to consider becoming involved in efforts to bolster the industry. He believes the health of the local economy relies heavily on the success of the semiconductor companies. He noted that Fort Collins lost 800 jobs in this field from 2006-2009. Mike’s team is looking for a way to address this issue. He distributed a handout that highlights Grenoble, a city that might serve as a good model for Fort Collins. He believes we need to proactively market our community. He said the City of Fort Collins has some money (amount wasn’t mentioned) earmarked for this initiative.

• Question from Scott Makinen: You said you’ve had success in other industries. Any generalizations on what has worked and why?
• Answer from Mike: Not sure I understand the semiconductor industry. The level of competition around the table is different than other groups that have been successful. Most interactions have been led by HP. If we have significant erosion in this sector, the impact would be tremendous.

• Question from Fernando Tomasel: Are you familiar with nanotechnology center in Albany? They are a beautiful example of what can work.

• Answer from Mike: Yes. It is a great example, along with Grenoble.

**Call to action:** If you would like to play a role in efforts to support the local semiconductor industry as well as promote Fort Collins’ strengths as a high-tech center, please contact Mike Freeman: mfreeman@fcgov.com.

The IEEE-Solid State Circuit Society will be hosting a panel-based discussion on this topic on **Wednesday, June 8, 6:00-9:00 pm,** at the Avago campus, Building 1 (NE corner of Harmony and Ziegler). **Contact Alvin Loke if interested: Alvin.Loke@amd.com.**

7. **Research Spotlight: Sudeep Pasricha (Assistant Professor)**
   Dr. Pasricha shared detailed information about his research in embedded systems. He outlined his main areas of focus, including the associated problems and solutions. He also provided examples of cutting-edge student projects under his guidance.

8. **CSU Distance Education (Carl Melle)**
   Carl outlined the history of online education as well as predictions for the future. Distance education has been around forever, he said, but online learning is new. He said we are at the forefront of moving into the 8th generation of mobile technologies for online classes. Carl showed example of Dr. Chong’s online course. He explained the concept behind a new online ECE degree – a flexible, coursework-only degree that will be awarded as a Master of Engineering in Electrical and Computer Engineering. Students can also earn certificates in ECE focus areas that can be applied toward the M.E. degree. Carl expressed the need for help from the IAB to identify the focus areas for the online certificates.

   Currently, students will receive a framed certificate with the completion of the required courses. The certificates are not denoted on transcripts. Some board members said this could be a problem. Carl said that changing the University’s policy is difficult, but it would be useful to have the support of the IAB along with the department heads and college deans. The department will reach out to the IAB if a written statement of support is needed.

9. **Breakout Session: ECE Distance Education (Facilitators: Jim Greener)**
   The board split into groups to discuss and brainstorm the following:
   - Questions from the survey handout
   - Advertising suggestions
   - Desired expectations/competencies for graduates of the online master’s program
   - Focus areas for certificates
Breakout Results:

Certificates:
- The certificate piece is extremely valuable, as it gives engineers flexibility and room for growth. Students can earn a certificate without fear of absolute failure. This is a nice way to work toward a degree. Being able to group courses into sections might entice someone to pursue a master’s degree.
  - Question from Tony: So if a degree is intimidating, but a certificate can be manageable, how do we market that to prospective students?
  - Comment: Advertise certificates. They’re not only applicable toward the degree, but they can be standalone. It can be intimidating to look at the package as a whole.
  - Tony: So the message should be: The certificates will keep you current with the potential of creating a new career path, AND you can easily take it to the next level by applying your specialized certificate(s) toward a master’s degree.
  - Question: To get into the certificate program, do you have to pass a GRE?
  - Answer: There are admissions requirements. You can register as a guest and take classes and get credit. Limit is 9 courses without being officially enrolled.

- Most people agreed that a certificate is valuable, but some board members didn’t seem to think it would help an individual’s marketability. However, they liked having the ability to group courses into focus areas.

Coursework:
- Adding business courses is good, especially product development. Engineering graduate students have to understand business.
- Marketing is another skill they may have to learn – translating what is being developed into what the end customer desires, even if it is just requirements generation.
- Biomed or biology may be useful, especially for medical product design.
- Specifically related to power engineering: there is a need for short courses. Mathematics, software, etc., should be included.
- Mathematical refresher might be good for new engineers or other refresher courses.
- Everyone agrees that Systems Engineering courses are extremely valuable.
- Offer a master’s with a people management route (less emphasis on technical skills). Engineers work their way to a management position because of their technical skills, but there is an art to managing people.
- Tony mentioned that management courses came up over and over again with regard to the Systems Engineering program. For that program, business courses are part of the core. He asked the board if it would be desirable to offer a similar format for the online master’s degree in electrical and computer engineering. The board thinks a couple courses would be beneficial. However, it’s important to keep the focus on engineering.

Marketing:
- Identify primary audience.
- One major benefit of the program is that it’s very flexible – this should be highlighted in all marketing messages.
To be truly successful we may need to rely on champions within key companies.

- Work with industries in aerospace to produce case studies. Make these testimonials available to prospective students.
- It’s important for the IAB to serve as advocates in spreading the word.
- The department might consider visiting companies to promote the program.
  - Carl Melle likes to visit companies to educate prospective students about the program. He would gladly go to companies to show them how the online program works. He would provide examples and statistics to show the effectiveness of the Systems Engineering program.
- Carl noted that customer reviews are helpful. The Distance Education department is developing a course evaluation system that allows people to view candid, uncensored feedback from students who have taken a given course.
- In developing the program, it’s important to consider the international markets. With the asynchronous model, coursework can be offered abroad.
- Look at deficiencies of other programs. Take into account the costs of other online programs.
- In terms of marketing, make clear that all courses could apply toward the master’s degree.

10. **IAB Elections (Facilitator: Jim Greener)**

The board unanimously voted in favor of Scott Makinen as the new IAB vice president. Jim Greener becomes IAB president. Special thanks to outgoing president, Michael Coddington, for two years of outstanding leadership.

11. **Closing Remarks (Tony Maciejewski)**

Tony wrapped up the meeting and thanked the board for their participation. He encouraged everyone to join the department immediately afterward for the IAB social at Odell Brewing.

The results of the distance education surveys will be tallied and reviewed to help develop the new online program. The survey will also be recreated using an online web tool. The IAB will be asked to disseminate the survey and encourage their colleagues to participate.

**ACTION ITEMS:**

- Offer ECE lab tours after a future meeting (consider for the fall).
- Provide Mike Freeman’s contact information to the board, along with details regarding the IEEE panel discussion about the local chip industry.
- In developing the curriculum for the new online degree program, focus on flexibility so that students can tailor their coursework.
- Offer certificates in focus areas that are of greatest interest to the industry. Use feedback from the spring IAB meeting along with the results of the distance education survey to determine key areas of interest.
- Use feedback from the IAB and the survey to determine which courses need to be developed for online delivery.
- In promoting the new program, advertise the certificates and the fact that they can be applied toward the M.E. degree.
- In terms of marketing messages, promote the flexibility of the new online degree program.
- Rely on industry partners to help spread the word about the online degree program. Continually provide the board with information to share with their colleagues.
- Consider developing case studies/testimonials to promote the online program.
- Visit companies to spread the word about the online program.
- Consider hosting a future IAB meeting somewhere in the Denver area.

The fall IAB meeting is scheduled for Friday, October 7, 2011.