IAB members present:
Tim Ash, Colin Baldwin, Paul Beiser, Michael Coddington, Randy Crane, Chuck Duey, Jason Gentry, Jim Greener, Bob Gresham, Todd Hansell, Ed Hulls, Michael Kotson, Alvin Loke, Scott Makinen, Grant Miller, Paul Monson, John Nichols, Orhan Norman, Randy Paffenroth, Chuck Quire, Kurt Rentel, Duane Spence.

ECE faculty and staff present:
Anura Jayasumana, Andrea Leland, Tony Maciejewski, Olivera Notaros, Sid Suryanarayanan, HJ Siegel, Peter Young.

Guests:
Steve Catanach, director of Fort Collins Power & Light, and a small group of ECE undergraduate and graduate students.

1. Introduction and Welcome (Michael Coddington, IAB president)
Michael Coddington opened the meeting by welcoming new members and visitors: Randy Crane, Microsoft; Bob Gresham, Zachry; Todd Hansell, Covidien; Randy Paffenroth, Numerica Corp.

2. Department Update (ECE Department Head Tony Maciejewski)
Tony began his presentation by recognizing and thanking IAB members with at least 10 years of service: Ed Hulls. Ed expressed his appreciation for serving on the board and announced that he would be stepping down from his role as he moves into retirement from WAPA.

Tony then gave his department update, addressing the following topics:
- New smart-grid faculty join ECE:
  - Dr. Liuqing Yang, Associate Professor
  - Dr. Sid Suryanarayanan, Assistant Professor
- National Research Council recently ranked ECE’s doctoral program among the nation’s best.
- NSF ranked CSU one of the nation’s top 50 research institution; #2 in the nation among public research universities without a medical school, #1 on a per faculty basis.
- Dr. Sega appointed to shared leadership position with CSU and Ohio State
- Biomedical program launched
  - ECE Professor Kevin Lear will serve as associate director as well as director of undergraduate programs
- M.S. and Ph.D. in Systems Engineering now available
35 enrolled in M.E. degree via Distance Education
- Professor Mario Marconi named Fellow of Optical Society of America
- Professor Branislav Notaros publishes new book in electromagnetics
- Optical Biosensor team wins 2010 Best Paper Contest
  - Team also received “Future Innovator Award” at Centennial Celebration and top College of Engineering prize at E-Days.

**Graphs and charts:**
- Distribution of College of Engineering research expenditures (09-10)
- Trends in College of Engineering research expenditures (FY05-10)
- Trends in ECE research expenditures (FY05-10)
- College of Engineering generated credit hours
- ECE generated credit hours
- National engineering enrollment trends
- ECE enrollment trends
- Freshmen enrollment trends
- Undergraduate degrees awarded
- Women in ECE
- Women in the College of Engineering
- Graduate degrees awarded
- Percentage of graduate degrees awarded to international students

3. **Update on Spring Action Items**
The ECE Tiger Team – a group of faculty, staff, and students formed to address recruitment and retention – assessed the many suggestions and ideas from the spring 2010 IAB meeting. They identified priority action items in key areas (listed below) to focus on in the coming months.

- Care and Feeding in ECE
- Energizing Student Organizations
- Designing the Freshman and Sophomore Years for Motivation and Retention
- Summer Internships for Honorable Students
- Tools and Programming in the ECE Curriculum
- Misc. Pedagogical Innovations in the ECE Curriculum

*Status updates are included where applicable.*

**Care and Feeding in ECE**
- **Action item:** Continue “Design Your Future Day.”
- **Status:** Event held October 20. 22 engineers, 7 faculty, and 4 grad students met with approximately 35 ECE students; **overall student rating of event was 4.6,** with 3 being average, 4 good, and 5 excellent. The 2011 event will be held in October (date TBD).
- **Action item:** Follow through on mentoring program.
- **Status:** Program launched in early spring.
- **Action item:** Continue student social events to build community
- **Status:** Ice cream social held in September - 140 servings of Walrus ice cream served! Semester-ending parties scheduled for students, faculty, and staff.
- **Action item:** Use social networks to improve communication with students.
- **Status:** Ramped up Facebook presence; investigating Twitter.
Energizing Student Organizations

- **Action item:** Department will give $250 service awards each semester to IEEE and HKN officers.
- **Status:** Process in place to give awards to student officers in the fall and spring.
- **Action item:** Ensure that student organizations are active and engaged.
- **Status:** Officers recently received mini-grant from IEEE Standards Education Program; initiated Open Design Competition and solicited industry sponsorship; ramped up tutoring program, with officers logging extra hours during the summer months; and are selling ECE T-shirts to raise money and build community among students.
- **Action item:** Department and student work together to seek funding to refurbish ECE study lounge.
- **Status:** Proposal submitted to University Facility Fee Advisory Board (UFFAB) for funding to completely refurbish the space and provide new furnishings. It has received favorable reviews from the UFFAB. A final decision will be made in late spring.

Designing the Freshman & Sophomore Years for Motivation and Retention

- **Action item:** Work with Math Department to get mathematics courses for engineering students taught by regular faculty (not TAs).
- **Action item:** Upgrade circuits courses to include more demonstrations and inspiring lab assignments.
- **Status:** Seeking new equipment from Agilent to help revitalize the circuits lab.
- **Action item:** Exploring idea of a more comprehensive summer session schedule of ECE courses to help students make up failed freshman and sophomore courses.

Summer Internships for Honorable Students

- **Action item:** Utilize student organizations to promote existing internship program.
- **Action item:** Explore the idea of a summer internship program for all freshman, sophomore, and junior students whose GPA is greater than or equal to 3.4 (about 45 students); engage industry and engineering career counselor.
- **Action item:** Make use of social networks to push internship opportunities.
- **Status:** All job openings and internships that are shared with the department are being publicized to students through regular channels (email, career center database, etc.) as well as Facebook.

Tools & Programming in the ECE Curriculum

- **Action item:** Work with CS to redesign software sequences in the ECE curriculum – more C, C++.
- **Action item:** Make use of MATLAB and CADENCE tools a common thread throughout ECE curriculum.

Misc. Pedagogical Innovations in the ECE Curriculum

- **Action item:** Increase awareness and continue pushing accelerated BS/MS program.
- **Action item:** Maintain IO diagrams.
- **Action item:** Establish a portfolio program for students.
- **Status:** Steps are being taken to implement a process for students keep portfolios to highlight projects and serve as a record of achievement to be viewed by prospective employers.

4. **Research Spotlight: Sid Suryanarayanan (Assistant Professor)**

Dr. Suryanarayanan, who joined the department in the fall, shared detailed information about his research in smart-grid systems. He outlined his main areas of focus and highlighted key projects.
5. **Industry Spotlight: Raytheon (Duane Spence)**
Duane gave an overview of Raytheon, including core markets, number of employees, and locations worldwide. He also shared information about the projects at the Aurora facility, specifically his work with the GPS project.

6. **Overview of FortZED (Steve Catanach, Director, Light & Power of Fort Collins)**
Steve briefly discussed FortZED and then shared an informative video about the project. FortZED strives to be the model community for a leading and replicable net Zero Energy District. The mission of FortZED is to transform the downtown Fort Collins area and the main campus of Colorado State University into a net Zero Energy District through conservation, efficiency, renewable sources, and smart technologies. For more information, visit: [http://fortzed.com/](http://fortzed.com/).

7. **ECE Strengths and Research Thrusts (Tony Maciejewski)**
To frame the breakout session, Tony provided a snapshot of the department’s research thrusts, as well as a listing of the faculty in each area. He also showed how the research areas (and faculty) have changed since 2004. He shared the challenges related to hiring new faculty and noted how difficult it is to change the course of the department. A constraint is that funding for new faculty is often tied to the current economic climate and emerging trends, which may not be the desired direction of the department. Also, these emerging areas may not enhance ECE’s core strengths. All new hiring requests must appeal to CSU’s upper administration.

---Question from Colin Baldwin: Have there been any studies on where the jobs are relative to ECE’s major areas of focus?

8. **Breakout Session: Strategic Partnerships (Facilitators: Michael Coddington & Jim Greener)**
The board split into groups to brainstorm the following questions:
- Are there ECE focus areas or projects that closely align with your company’s strengths?
- What are your ideas for mutually beneficial partnerships?
- Do you have ideas for collaborations that involve multiple organizations (like FortZED)?
- How can the department balance opportunities for growth in emerging areas while continuing to focus on our core strengths and constituents?

**Breakout Results:**
- Future research partnerships with the university may not be as feasible for more mature companies that aren’t looking for long-term collaborations. Such companies are more concerned about short-term product development with rapid delivery to the market.
- Emerging markets, such as smart-grid, may be ripe for new research activity.
- Numerica Corp is working on multiple projects with research and development mathematical projects.
- Leverage existing strengths in systems engineering to build new partnerships. This would span multiple fields, particularly appealing to the defense industry.
• Host seminar series (perhaps in partnership with the IEEE) and use as a marketing tool to increase industry interest and awareness of ECE’s research work.
• How many partnerships can faculty handle?
• For many companies future relationships depend on where the R&D occurs. In some cases, it may be harder to build ties with CSU because R&D labs are in facilities outside Colorado.
• IP is an issue for companies. Quality contracts are needed.
  o Tony asked the board: What is the process to get collaborations moving with industry? How do we learn from Fort ZED?
• Even in industry with tight IP rules, it’s important to look at developing processes around standards. The university should get involved with standards committees.
• There are barriers related to faculty involvement with competitors. For example, AMD will not work with Tom Chen because he has a relationship with Intel.
• Most successful partnerships begin through personal contacts. Networking is important.
  o Tony asked: How do we get industry networks connecting with academic networks?
• ECE might consider creating a consortium that requires industry to pay when members bring ideas to the consortium. The sharing of proprietary information would help justify the charge.
• Establishing a pipeline with companies is a start – it’s good for students and companies.
• Importance of internships, co-ops, etc. to build from the ground up.
  o Tony noted: We’re trying to share that mission with students. Time constraints make it hard for them.
• Make internships part of the curriculum.
  o HP has a coop-intern for credit.
• ECE students wondered if companies would be interested in younger students for internships, not just juniors and seniors.
• More student involvement with industry, e.g., something similar to a shadow day, field trips, senior design.
• Industry can always donate equipment (contact Andrea Leland: andrea.leland@colostate.edu) and sponsor projects (contact Olivera Notaros: olivera@engr.colostate.edu).
• Personal networks will continue to be critical to building successful partnerships.

9. **Student Design Presentations**

10. **Closing Remarks (Tony Maciejewski)**
    Tony wrapped up the meeting and thanked the board for their participation. He also discussed having the spring meeting in the afternoon instead of the traditional morning session. The board unanimously agreed to try meeting in the afternoon in the spring, and perhaps rotate mornings and afternoons for future meetings. They also thought it would be good to include a social mixer after the spring meeting, perhaps offsite. Finally, they mentioned incorporating tours of the ECE labs at some point for interested board members.

**ACTION ITEMS:**

• Continue working with Math Department to get mathematics courses for engineering students taught by regular faculty (not TAs).
• Leverage existing strengths in systems engineering to build new partnerships.
• Host seminar series (perhaps in partnership with the IEEE) and use as a marketing tool to increase industry interest and awareness of ECE’s research work.
• Try to tackle obstacles related to IP by looking at developing processes around standards and getting involved with standards committees.
• More student involvement with industry, e.g., field trips, senior design sponsorship, internships for lower-level students (freshmen and sophomores).
• Make IAB contact information available to all members to help build personal connections and networks.
• Offer ECE lab tours for interested board members at a future meeting.
• Work to expand and improve internship program. Engage industry and involve College of Engineering career office.

The spring IAB meeting is scheduled for Friday, May 6.