Welcome

Jason Gentry, IAB President
Welcome IAB guests

• New names and faces (action item from FA13)
  – Shirish Bahirat, Micron
  – Martin Glapa, Alcatel-Lucent
  – Mike Hawes, Agilent
  – David Lacey, Hewlett-Packard
  – Eric Mather, Lockheed Martin
  – Kerry McBee, Xcel Energy
  – Greg Nuccio, Jeppesen
  – Richard Robinson, Nimsoft
Agenda

• Experimenting with new format – tell us what you think
  – Department Update
  – Prepare for Engineering Days (E-Days)
  – Review E-Days Projects at Moby
  – Return to Durrell Center
  – Working Lunch & Breakout Session: Review Results of E-Days Judging
  – Discuss Results of Breakout Session
  – Election
  – Social Event at Fort Collins Brewery
10-years of service
Thank you!

- Susan Hunter
- John Nichols

2005 - Student Advising Day (now called Design Your Future Day)

SP07 IAB meeting (John has attended almost all of the meetings since joining in 2004)
Faculty News

• Professor Jade Morton to join ECE in FA14
• Professor Reising lands $4.5M grant to help NASA study clouds and climate
ECE faculty garner new fellow awards

- **Biedron**: SPIE & American Physical Society
- **Menoni**: SPIE
- **Morton**: IEEE
- **Bartels**: American Physical Society
ERC Profs Propel Innovation

• Chandra leads partnership to install tornado radar near Dallas/Fort Worth
• Menoni bolsters reputation as role model for women in science
  – Featured in *International Innovation*
  – Chosen to deliver worldwide webinar for Women in Engineering
Student News

• Student-led Annual IEEE Open Design Competition a success!
  – Thank you industry judges and sponsors!
  – Winners: Free EMG (ECE); Diggerbot (ME); Math Racerz (ECE)

• EE major Wirtz wins Goldwater Scholarship
  – 1 of 283 students nationwide selected
• 7th Annual Best Paper Contest begins May 6th
  – Thanks to IEEE Plains Section for donating the prize money
  – Judges will review papers for all E-Days projects
  – Contact Andrea if interested

• Commencement set for May 16th at Moby
ECE Faculty by the Numbers

- 25 faculty
- $515K per faculty (FY2013)
- 0.4 PhD degrees per faculty (2012)
- High percentage of Fellows and professional awards
- Relatively small number of faculty
ECE ranks high in research

- ECE faculty rank **28th** (out of 370 programs) in the country for research expenditures per faculty member
  - ECE is **36th** overall for total research funding

- ECE outranks:
  - Purdue
  - Princeton
  - U. CA, Davis
  - Texas A&M
  - CU

*NSF data (2009)*
National Enrollment Trends

- Biomedical Engineering
- Electrical & Computer Engineering
- Mechanical Engineering
- Chemical Engineering
- Engineering Science
- Civil Engineering
- Environmental Engineering
- Total Engineering

Taken from ASEE - 2013 numbers will be reported in May.
Undergraduate Degrees Awarded

Calendar Year

Number

BScpE
BSEE

2007
2008
2009
2010
2011
2012
2013
ECE Freshmen Enrollment:
Colorado Institutions (2007 vs 2012)

- **Colorado State University**: ↓3%
- **University of Colorado at Denver**: ↑25%
- **University of Colorado at Boulder**: ↓34%
- **University of Colorado at Colorado Springs**: ↑37%
- **University of Denver**: ↑100%
Fall Freshmen Enrollment

- FA08
- FA09
- FA10
- FA11
- FA12
- FA13

Legend:
- Freshmen Biom/EE
- Freshmen Biom/EELO
- Freshmen CpE
- Freshmen EE
Fall -> Spring Freshmen Enrollment

The graph shows the enrollment data for different programs from Fall 2008 to Spring 2014. The programs include Biomed/EELO, Biomed/EE, Computer Engineering, and Electrical Engineering. The bars represent the enrollment numbers, with different colors indicating the enrollment across these programs.
Spring Enrollment Trends by Class

- Freshmen Total
- Sophomore Total
- Junior Total
- Senior Total

SP09
SP10
SP11
SP12
SP13
SP14
Women in Engineering (FA13)

Undergraduate
- Intra-College: 27%
- CBE: 16%
- CEE: 31%
- ME: 20%
- ECE: 6%

Graduate
- Intra-College: 3%
- ME: 8%
- CBE: 4%
- AS: 19%
- ECE: 23%
- CEE: 43%
% of International Degrees Awarded

![Graph showing the percentage of international degrees awarded from 2007 to 2013, categorized by MS, Ph.D., and Total. The graph indicates fluctuations in the percentage over the years.]
The Value of a College Degree: Median First-Year Earnings by CO Institution

Source: CollegeMeasures.org
Median First-Year Earnings in EE by CO Institution

Source: CollegeMeasures.org
Median First-Year Earnings in BSCpE by CO Institution

- **Colorado State University**: $62,871
- **University of Colorado Colorado Springs**: $56,000
- **University of Colorado Boulder**: $54,000

Source: CollegeMeasures.org
ABET Update

• Department reaccredited
• *Design Your Future Day* cited as program strength (action item from previous IAB meeting)
• New Program Educational Objectives developed and approved by ECE faculty and the IAB
• The ECE PEOs are designed and implemented around three principal attributes:
  – Mastery
  – Innovation
  – Leadership
Adjunct Teaching Opportunities

• Hands-on training with FPGA programming
• Hands-on training with Verilog and VHDL
• Hands-on training with optimizing embedded software
• VLSI System Design I w/lab – design of integrated circuits at the system level including cell design, digital systems, parallel architecture, systolic arrays
Update on Fall Action Items

• **Action item:** Visit new Advanced Beam Lab as part of a future IAB meeting.
  – **Status:** Planned for FA14.

• **Action item:** Find out if it’s possible to allow students to slightly delay their decision to pursue a dual major, but still move in the desired direction of BME/EE.
  – **Status:** Students need to make a decision after the completion of freshman year to stay on track.
• **Action item:** Report back on status of senior design video project.
  – **Status:** Some students created new videos that we will share online; department developing videos to highlight senior design and ECE 202 projects.

• **Action item:** Find out if it’s possible to earn a master’s in systems engineering as part of the accelerated BS/MS program.
  – **Status:** Possible with graduate school approval.
    • In addition, accelerated BS/Ph.D. is currently under review by CSU Grad School.
• **Action item:** Share feedback from faculty retreat regarding ECE’s role in MOOCs.
  
  – **Status:** Prof. Chandra is considering a MOOC; general consensus is to expand coursework through OnlinePlus rather than put effort into MOOCs.
Future of MOOCs

– Coursera’s new CEO recently reiterated MOOCs should be thought of as “additive to what universities are doing, not disruptive.”

– Udacity will no longer offer free certificates.

– Harvard U. will offer exclusive MOOCs to alumni.

– Harvard and MIT recently released visualization tools for trove of data.
  • More than 1 million registered for 17 of the two institutions’ MOOCs.
## Current Enrollment in Online Degrees

<table>
<thead>
<tr>
<th>Enrollment in Online Degrees</th>
<th></th>
</tr>
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<tbody>
<tr>
<td>Electrical &amp; Computer Engineering (ME)</td>
<td>5</td>
</tr>
<tr>
<td>Systems Engineering (ME)</td>
<td>34</td>
</tr>
<tr>
<td>Systems Engineering (MS)</td>
<td>18</td>
</tr>
<tr>
<td>Systems Engineering (PhD)</td>
<td>31</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>88</strong></td>
</tr>
</tbody>
</table>
Action items related to biomedical/EE recruitment:

• Utilize presentations like Todd Hansell’s Covidien overview to recruit students.
  – **Status:** Todd Hansell is working with ECE & BME to participate in outreach events; he tweaked his IAB talk for an H.S. audience.

• Share salary benefits of biomedical industry, if available.
  – **Status:** Results of 2014 Salary Survey*

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Average Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bioengineering &amp; Biomedical Engineering</td>
<td>$47,300</td>
</tr>
<tr>
<td>Computer Engineering</td>
<td>$70,900</td>
</tr>
<tr>
<td>Electrical/Electronics Engineering</td>
<td>$63,000</td>
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</tbody>
</table>

*National Association of Colleges and Employers January 2014 Salary Survey*
• Leverage NSF Research Experience for Teachers site grant to maximize recruitment.
  – **Status:** Teachers in NSF RET program promote STEM careers to their students and arrange campus tours
  – On average, one high school teacher reaches 150 students per year
  – Special focus on women and minorities
• Leverage biomedical recruitment efforts to attract more women to ECE; make recruitment materials more tangible.
  
  – **Status:** Messaging revamped to show real-world applications of ECE/BME work; new materials include banners for recruitment events, web content, and promotional video.
Prepare for E-Days

Tony Maciejewski
Your input matters!

*Program changes based on your ideas (FA06)*

- **Design**
  - **Action item:** Incorporate design throughout the curriculum.
  - **Status:** Projects now required in ECE 202.
  - **Action item:** Generate more interdisciplinary projects.
  - **Status:** Now have multiple projects each year that span disciplines.

- **Communication**
  - **Action item:** Create Best Paper Contest to reinforce importance of written communications.
  - **Status:** Contest in its 7th year.
• **Communication (continued)**
  – **Action item:** Ask IAB members to serve on panel to review project presentations.
  – **Status:** Several board members are heavily involved in senior design and judge oral presentations each fall.

• **Project Management**
  – **Action item:** Teach project management skills through the senior design lecture series.
  – **Status:**
    • Weekly lectures touch on a range of topics to enhance professional development, including project management.
    • Test plan now required for each project; dedicated industry partner reads and evaluates each plan.
• Teamwork
  – **Action item:** Offer professional development courses to address team dynamics.
  – **Status:** COE Professional Learning Institute established, led by former IAB member Alma Rosales.

• Multi-year Projects
  – **Action item:** Consider creating more multi-year, multi-phase projects.
  – **Status:** A number of projects span multiple years, with new teams building on the work of previous students.
Judging Considerations

• How are we doing overall?
  – Can you see the impact of your previous suggestions?

• What are the strengths and weaknesses of the senior design program?

• What changes/improvements would you recommend?

• What are the top three projects? What makes them great?
Leave for Moby Arena
Lunch & Breakout Session: Discuss Senior Design Program

Facilitators: Jason Gentry and Scott Evans
Results of Breakout Session

Facilitators: Jason Gentry and Scott Evans
Election

Facilitator: Jason Gentry
Closing Remarks, Depart for Social Event

Tony Maciejewski