Spring Industrial Advisory Board Meeting
April 14, 2017
Introduction & Welcome
Agenda

- Department Update
- Professionalism Thread Update
- Engineer in Residence Update
- Prep for E-Days
- View Projects at E-Days
- Lunch
- Breakout Session
- Report Results of Breakout Session
- Election
- Social at The Mayor
Welcome Guests/New Members

- **Dave Christie**, Advanced Energy
- **Steve Pacheco**, Woodward
Department Update

Prof. Tony Maciejewski
Department Head
Electrical and Computer Engineering
Colorado State University
10 Years of Service – Thank You!

• Dana Kirchmar
• Scott Makinen

Circa 2007
Our Latest Fellow Awards

Carmen Menoni
American Association for the Advancement of Science

Stephen Milton
Institute of Electrical & Electronics Engineers

Branislav Notaros
Applied Computational Electromagnetics Society
ECE Receives Radar Gift from Vaisala
Recent Breakthroughs

• Conditions inside stars recreated with compact lasers (Rocca)

• Groundbreaking visualization of cell membrane interactions (Krapf)

• Microscope built with 3-D and high-resolution image processing (Bartels)
ECE Wins Big at College Awards Ceremony

• **V.N. Bringi**, Meritorious Faculty Emeritus

• **Tom Chen**, Abell Outstanding Economic Development

• **Olivera Notaros**, Abell Outstanding Teaching and Service Faculty

• **Melissa Reese**, Outstanding Administrative Professional

• **Liuqing Yang**, Art Corey Outstanding International Contributions
Alumni and Development News

Carl Wilmsen ECE Scholarship endowed

CSU’s largest gift in history renames college
Recent Alumni Features

Susan Benzel leading “The Machine”

Ian Bernstein creator of popular Star Wars BB-8
Upcoming Events

• Annual Best Paper Contest in June
  • Contact Andrea if interested

• Commencement set for Friday, May 12
COE Research Expenditures FY16

- CIRA: 33%
- College of Engineering: 46%
- ATS: 20%
- ECE: 14%
- CEE: 19%
- ME: 11%
- CBE: 3%

ATS  CIRA  ECE  CEE  ME  CBE
ECE Research Expenditures

Fiscal Year

$0

$2,000,000

$4,000,000

$6,000,000

$8,000,000

$10,000,000

$12,000,000

$14,000,000

2001

2002

2003

2004

2005

2006

2007

2008

2009

2010

2011

2012

2013

2014

2015

2016
# Proposal Activity (FY17)

<table>
<thead>
<tr>
<th>25 ECE Faculty</th>
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<tbody>
<tr>
<td>Proposals submitted to date</td>
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<tr>
<td>Total amount of proposals</td>
</tr>
<tr>
<td>Highest proposal amount w/ECE as lead</td>
</tr>
<tr>
<td>Highest proposal amount w/ECE as collaborator</td>
</tr>
<tr>
<td>Lowest proposal amount</td>
</tr>
<tr>
<td>Primary funding agencies</td>
</tr>
<tr>
<td>Collaborators</td>
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</table>
Teaching Productivity
ECE Student Credit Hours


- Undergrad
- Grad

Credit Hours: 0, 1,000, 2,000, 3,000, 4,000, 5,000, 6,000, 7,000, 8,000, 9,000

Graph showing teaching productivity with bars for Undergrad and Grad from 2011-2012 to 2015-2016.
National Enrollments by Discipline

Information retrieved from ASEE Engineering by the Numbers

Mech Engr
ECE
Civil Engineering
Chemical Engineering
Biomedical Engineering
Environmental Engineering
Engr. Science and Engr. Physics
Total

Total Enrollment

Students by Discipline

Biomedical Dual Majors

Department by Year


Number of Students

- Bio Eng w/EL
- Bio Eng w/EE
- Bio Eng w/CB
- Bio Eng w/ME
Nontraditional Undergrads in ECE

Number of Students

SP12  SP13  SP14  SP15  SP16  SP17

- Nontraditional
- Traditional

Colorado State University
Department of Electrical and Computer Engineering
First-Generation Undergrads in ECE

<table>
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<tr>
<th>Year</th>
<th>Number of Students</th>
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<tr>
<td>SP12</td>
<td>200</td>
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<tr>
<td>SP13</td>
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<tr>
<td>SP14</td>
<td>300</td>
</tr>
<tr>
<td>SP15</td>
<td>350</td>
</tr>
<tr>
<td>SP16</td>
<td>400</td>
</tr>
<tr>
<td>SP17</td>
<td>450</td>
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- First-Generation
# Freshmen Admissions Outlook (April)

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<tr>
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<th>April 2017</th>
<th>April 2016</th>
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<tbody>
<tr>
<td>Computer Engineering</td>
<td></td>
<td></td>
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<tr>
<td>Confirms 4/7/17</td>
<td>47</td>
<td></td>
</tr>
<tr>
<td>Confirms 4/7/16</td>
<td>37</td>
<td></td>
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<tr>
<td>Electrical Engineering</td>
<td></td>
<td></td>
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<tr>
<td>Confirms 4/7/17</td>
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<td></td>
</tr>
<tr>
<td>Confirms 4/7/16</td>
<td>43</td>
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<tr>
<td>Freshmen Total</td>
<td>85</td>
<td>80</td>
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</table>
National Persistence in Engineering

Persisted to 2nd year | Degree within 6 years | Degree within 4 years
Percent
ECE Freshmen Retention to 2nd Fall

Cohort Size of First-Year ECE Students

Persistence Rates of First-Year ECE Students Through 2nd Fall

Dot com bubble
“World is Flat”
The Great Recession

Persistence Rates Within Department by Cohort Department and Cohort Term
ECE Freshmen Retention to 6th Fall

Cohort Size of First-Year ECE Students

Persistence Rates of First-Year ECE Students through the 6th Fall

Persistence Rates Within Department by Cohort Department and Cohort Term
Women in Engineering (FA16)

Undergraduate
- Intra-College, 32%
- CEE, 28%
- ME, 17%
- CBE, 15%
- ECE, 8%

Graduate
- CEE, 38%
- AS, 15%
- CBE, 5%
- BME, 9%
- ME, 7%
- Intra-College, 4%
- ECE, 23%
Women in ECE at CSU

<table>
<thead>
<tr>
<th></th>
<th>Number UG Women</th>
<th>Percent UG Women</th>
<th>Number GR Women</th>
<th>Percent GR Women</th>
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<tr>
<td>FA11</td>
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<tr>
<td>FA16</td>
<td></td>
<td></td>
<td>61</td>
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Undergraduate Degrees Awarded

![Bar chart showing the number of BSEE, BSCpE, and BioEE degrees awarded from 2008 to 2016. The chart shows an increase in the number of degrees awarded in 2016.]
Graduate Degrees Awarded

MS  Ph.D.  ME

Number

Calendar Year

Percent of International Degrees Awarded

Calendar Year


ME  MS  Ph.D.  Total

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
Career Outlook for ECE Majors

• Among the **top 10 majors in demand** for B.S., M.S., and Ph.D. degrees

• Average starting salaries:
  - Electrical engineering – $75,000
  - College average – $58,441
  - CSU average - $47,948

*National Association of Colleges and Employers Annual Job Outlook Reports
**CSU First Destination Study, 2016
College Degrees ROI

Engineers were least dependent on institutional prestige

*The Economist, March 2015*
Early Results of RED

- Anecdotally, LSMs and KIs well received by many students
- Number of students receiving Ds, Fs, or withdrawals in technical core has been cut in half (FA16 vs. FA15)
- Engineer in Residence a success
- Increased interest in student projects throughout curriculum
Status of M.S. & Ph.D. in Computer Engineering

- Program launched and open for enrollment
- Adding new faculty member in fall
Reminder:
New ECE Certificates Available

- Computer Systems Engineering
- Embedded Systems
- Power and Energy

ValuED
Education + Your Life
Update on Fall Action Items

• **Action item:** Continue to emphasize and expand K-12 outreach
  - **Status:** Karen Ungerer leading outreach for ECE
    - Successful high school counselor event held last month

• **Action item:** Provide status of ECE branding effort
  - **Status:** Key topic of ECEDHA annual meeting
    - Andrea serving on nationwide communications team
    - Tailfin Marketing hired to conduct focus groups and develop brand
Update on Fall Action Items

- **Action item:** Share opportunities to raise cultural awareness
  - **Status:** Leveraging CSU organizations to connect ECE students with multicultural programs and opportunities
    - Friday Afternoon Club
    - Culture Café Series
    - Study Abroad
    - Engineers Without Borders
Update on Fall Action Items

• **Action item:** Explore idea of geographically dispersed teams
  - **Status:** Currently incorporated in VIPs; pursuing internationally dispersed teams

• **Action item:** Provide assessment to evaluate students’ skills beyond technical abilities
  - **Status:** Sharing idea of student portfolios during professional formation thread update
Update on Fall Action Items

- **Action item:** Continue to provide enrollment data for entire College of Engineering
  - **Status:** Now included in IAB presentation each semester
Professional Formation Thread Update

Prof. Tom Siller
Professional Formation Thread Champion

Colorado State University
Department of Electrical and Computer Engineering
Engineer in Residence Update

Richard Toftness
IEEE Section Secretary & Engineer in Residence Program Director
Prepare for E-Days Judging
The Creativity Thread

• Thread Champion: Olivera

• Vertically Integrated Projects
  – Partnership with Georgia Tech

• Open Option Projects at all levels

• Research Experience for Undergraduates

• Senior Design

• Continuity of Optimization Tools
Industry Involvement in Creativity Thread

• Industry-sponsored projects (senior design, 202, OOP, VIPs)
  ➢ Technical involvement
  ➢ Financial sponsorship

• Individual involvement in projects
  ➢ Written and oral communications support
  ➢ Coaching/mentoring via senior design or EiR program
  ➢ Reviews of senior design reports for Best Paper Contest
  ➢ Judging oral presentations and project displays

• Classroom engagement through interactive sessions or lectures
Considerations for E-Days

• Can you tell a difference between projects (industry vs. faculty led vs. service oriented)?
  ➢ What are the pros and cons of the different types?

• How are we doing overall?
  ➢ What’s missing, if anything, in our projects?

• Which projects stand out, and what makes them great?
Assessing Professionalism in Projects

• Complete enclosed rubric to build on SP16 baseline

• Acceptable to use “n/a” or “.5” in your ratings
Results of SP16 Baseline Assessment of Professionalism in Senior Projects

Averages per category

0 - Unacceptable
1 - Developing
2 - Exceptional
Leave for LSC Ballroom
Breakout Session

E-Days Review & Homework

Facilitators:
Steve Martin and Art Lizotte
Homework

• How do you design your internship programs, and what traits do you look for in interns?
  ➢ How can we create student experiences that emulate your successes?
  ➢ How can we improve our practices to ensure our graduates possess the traits you desire?

• What are the demographics of your organization and/or work group?
E-Days Feedback

- Could you tell a difference between projects – industry vs. faculty led vs. service oriented?
  - What are the pros and cons of the different types?
  - What’s missing, if anything, in our projects?
- How can industry deepen involvement in student projects?
- Did you speak with a student today that you would hire? If so, why?
Report Results of Breakout Session

Facilitators: Steve Martin and Art Lizotte
Election for VP

Facilitator:
Art Lizotte
Closing Remarks
Social to follow at
The Mayor

Tony Maciejewski