Industrial Advisory Board

April 23, 2021
Hello and Welcome

• Say hello through the chat and share a greeting, if you wish

• Include your **name, company, and where** you’re tuning in from

• If you participated in a senior design project in college, we invite you to share the name of your project in the chat
Housekeeping for Virtual Meeting

• Raise hand anytime with questions
• Use chat function for questions, comments, or information sharing
• Mute audio unless speaking
• Use video if possible
• Session will be recorded
View Presentation

• See PDFs of presentation and agenda in chat for your reference
Agenda

• Department Update & Fall Action Items
• Prep for E-Days
• Break (9:10am)
• Transition to Breakout Rooms (9:20am)
• Breakouts with Design Teams (9:30-11am)
• Breakout Review
Guests and New Member

- **Joliann Beck**  
  Advisor, **Colorado Early Colleges**

- **Collin Turbert**  
  Head of School, **Colorado Early Colleges**

- **Dan Spieker (BSME ’06; ME Engineering ’14)**  
  Manager of Software R&D, **Lincoln Electric Automation/Wolf Robotics**
Department Update

Prof. Tony Maciejewski
Professor and Department Head
Electrical and Computer Engineering
Colorado State University
What I’ll Cover Today

• Update on New Normal
• Awards and Publicity
• ECE by the Numbers
• Status of Action Items
• New Initiatives
New Normal
ECE Operations Amid Pandemic

• Screening, contact tracing, and social norming campaigns in place

• Seeing signs of pandemic fatigue
  – Emphasis on mental health communications

• Some faculty, staff working remotely; on-campus research operations resumed
Looking Ahead to Fall

• Vaccine rollout underway
  ➢ Institutional Research working on voluntary reporting web page, which may help determine vaccination rates amongst students

• Overall, CSU is planning conservatively for fall
  ➢ ECE courses will be in person or synchronous hybrid mode
ECE Retirements

George Collins
retiring in May

Karen Ungerer
retiring in May; she will continue in part-time role
Department Awards
ECE Student Winner of MURALS

With more than 75 participants, Janaye Matthews won for her project that spotlighted widespread racial disparities amongst racial groups amid the pandemic.
Chandra Elected to National Academy of Inventors

Election to NAI Fellow is the highest professional distinction accorded solely to academic inventors
Chong Named AAAS fellow

He was honored for distinguished contributions to optimization and control theory and methods, particularly for stochastic networks and wireless systems.
Pasricha Honored for Helping ‘Propel Digital Age’

He was named a 2020 Distinguished Member of the ACM for outstanding contributions to the field of computing.
Nikdast Received NSF CAREER Award

He will use the five-year award to develop new technology for our data-driven society
ECE Won Big at College of Engineering Awards Ceremony

John Seim
Outstanding Staff Award

Reed Hollinger
Outstanding Researcher Award – Rising Star

Branislav Notaros
Outstanding International Contributions Award

Jesse Wilson
Early-Career Faculty Award

Diego Krapf
Outstanding Research Faculty Award
Research News
LaserNetUS Consortium, Including ECE, Receives $18M from DoE

ECE’s ALEPH laser, developed in-house, is one of the most powerful in the world
CSU Team Receives $1M Grant to Develop New Imaging Technologies

The Deep Tissue Imaging Grant is from the Chan Zuckerberg Initiative
ECE Receives NASA Grant to Develop New Satellite Technologies for Weather and Climate Missions

The $1.2M award will help Reising take CubeSats to the next level.
ECE Wins $1M Air Force Contract

Notaros’ award is one of the top projects in computational electromagnetics to fundamentally advance the Air Force’s RF simulation capability.
Beauchamp shared his thoughts on the mission and offered advice to aspiring engineers
Bohannon-Pea with Arrow Technologies
Led Development of Social Robot for Make-A-Wish Foundation

The robot will be a companion for a dragon-loving young girl as she battles bone cancer
Watnik Featured in Optics & Photonics News

Q&A with IAB member Abbie Watnik on ‘Staying Connected’
Tell Us Your Story!

Contact Andrea with news and ideas. We want to feature alumni and industry partners to inspire the next generation of electrical and computer engineers.
Regional Recognition
Colorado Ranked Among Most Innovative States in Nation

- #6 Overall
- #1 based on Human Capital, e.g., share of STEM professionals, STEM job demand, etc.

*WalletHub, “Most and Least Innovative States” – March 16, 2021
Milken Institute ‘Best-Performing Cities’

• Fort Collins ranked #12 for best cities for economic performance and growth for 2021
  – CSU and high-tech industry cited

“Fort Collins also enjoys well-established employer-education linkages that have sustained the regional economy through the COVID-19 pandemic,” Milken economists wrote.

*Milken “Best-Performing Cities Report” –2021
ECE by the Numbers
Engineering Enrollments at CSU

Includes BME dual degrees
Undergraduate Enrollments by Major

<table>
<thead>
<tr>
<th>Major</th>
<th>Fall 2015</th>
<th>Fall 2016</th>
<th>Fall 2017</th>
<th>Fall 2018</th>
<th>Fall 2019</th>
<th>Fall 2020</th>
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<tr>
<td>Computer Engineering</td>
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<td>131</td>
<td>149</td>
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<td>249</td>
<td>267</td>
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<td>258</td>
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<tr>
<td>Biomed + EE</td>
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<td>53</td>
<td>54</td>
<td>50</td>
<td>39</td>
<td>41</td>
</tr>
</tbody>
</table>
Undergraduate Enrollment Outlook for Fall 2021

• Two programs have seen significant growth over last year:
  – Computer Engineering
  – Civil Engineering

• Biomedical Engineering is down significantly
  – CU has new biomed program

• Mechanical Engineering is down overall, but large fraction of students interested in aerospace
ECE Graduate Enrollment

Number of students

PhD  Masters  ME

FA11  FA12  FA13  FA14  FA15  FA16  FA17  FA18  FA19  FA20
Graduate Enrollment Outlook for FA21

- Graduate admits up compared to last year
  - 125 admits as of April 19, 2021
  - Admitted 83 total by start of Fall 2020
  - 74 admits in April 2019

- “U.S. visas issued to students around the world have fallen...dramatically”*
  - Students from mainland China plummeted 99% since April

*Tech Crunch – 11/3/21
ECE Persistence

Persistence within Department and Cohort Size by Cohort Term
First-Time Full-Time Students

Cohort Term:
- Fall 2002
- Fall 2003
- Fall 2004
- Fall 2005
- Fall 2006
- Fall 2007
- Fall 2008
- Fall 2009
- Fall 2010
- Fall 2011
- Fall 2012
- Fall 2013
- Fall 2014
- Fall 2015
- Fall 2016
- Fall 2017
- Fall 2018
- Fall 2019
- Fall 2020

Persistence Rate:
- 0%
- 25%
- 50%
- 75%
- 100%

Cohort Size:
- 0
- 20
- 40
- 60
- 80
- 100
- 120

Legend:
- 2nd Fall Retention
- 4th Fall Persistence
- Cohort Size
Retention Concerns

- DFW (Ds, Fs, Withdrawals) rates are up by ~50%
  - Among highest DFW rates at CSU
- Suggestions about what to do?
Projected Undergraduate Degrees for Spring 2021

- Computer Engineering: 50
- Electrical Engineering: 19

Colorado State University
Department of Electrical and Computer Engineering
Fall Action Items
Hybrid Labs

**Action item:** Ensure access to professional equipment during hybrid labs.

**Status:** In addition to highly flexible analog devices that allow students to conduct experiments remotely, students also have access to industrial grade setups within the labs.
Curriculum

**Action item:** Consider using VR to extend learning beyond the two dimensional.

**Status:** Sudeep is leading student project to design games with VR and motion tracking technology for in-home patient rehabilitation.
- We will promote these opportunities through our recruitment efforts.
Professionalism

**Action item:** Try to create virtual internships for students through a collaboration with industry.

**Status:** With summer coming up – the time when many students are looking for internships – do any of you have internship opportunities to share? We would love to partner with you.
Recruitment

Action item: Bolster online presence to convey student experience while maintaining personal touch in recruitment.

Status:
• Held successful virtual grad recruiting event in Feb.
• Producing more videos to share our message.
• Launching new website this fall.
• Ramping up personal outreach to target audiences, e.g., underrepresented groups, veterans, and transfer students.
• Hiring new Undergraduate Program Coordinator with increased focus on recruiting.
Increasing Role of Community Colleges Among Bachelor's Degree Recipients

Figure 1
Community college attendance and receipt of an associate's degree among employed college graduates, by veteran status and calendar year of degree: 2019
Retention

**Action item:** Pandemic fatigue is real. Find ways to ensure personal touch in retention.

**Status related to retention:**
- Piloting new study group cohorts for incoming freshmen in FA21.
- Launched new diversity, equity, and inclusion series.
- Working to engage current students in retention efforts.
- Initiated targeted outreach related to mental health.
Holistic Model of ‘Total’ Student Experience

- **Enrollment**
  Marketing, recruitment, and prospective interactions that set ‘customer’ expectations before students arrive on campus

- **Administrative**
  Institutional processes, physical and digital estates, and systems that create the structure for delivering student support and fulfilling the teaching and learning mission

- **Social**
  Student clubs, athletics, student-to-student interactions, and relationships that contribute to student happiness and sense of belonging at the institution

- **Academic**
  Teaching and learning, assessment, and classroom activities that contribute to positive learning outcomes

- **Well-Being**
  Support staff, resources, and health services that attend to students’ personal needs and general well-being across mental, physical, and financial dimensions

- **Career**
  Skill acquisition, employment partnerships, placements, and internships that support and prepare students for the workplace

- Exploring retention ideas to support student success beyond academics
New Initiatives
Launching Aerospace Concentration

Available in Spring ’22, we’d love to partner with you to spread the word
Adding New Concentrations to Computer Engineering Major

- Aerospace Systems
- Intelligent Computing Systems
- Networks and Data
- VLSI and Integrated Circuits
Data Engineering Certificate Launched

Led by ECE department, the certificate is now available through CSU Online
Revamping ECE Website

• Brand-new look and feel and content
• More videos, visuals to help better promote the value of an ECE degree
• Target launch in Fall 2021
Diversity, Equity, and Inclusion Committee

• ECE committee formed to focus on culture of inclusion
• Programming dovetails college and university efforts
• Piloting “After CSU” series to highlight diverse backgrounds and experiences in ECE
Gender Gap in Tech Worsening*

- Gender gap for women worse now than in 1984
- 50% of women abandon tech careers by age 35
- Only 21% of women in study said they believed tech industry was a place they could thrive

*Forbes: “Are We Really Closing The Gender Gap In Tech?” – 3/3/21
Prep for Project Reviews
What to expect in breakouts

• Teams will start with 90-second elevator pitch

• Remaining time will be freeform Q&A. Please facilitate a discussion to assess teams’ professionalism skills:
  – Global and cultural awareness and adaptability
  – Effective communication
  – Awareness of ethics and professional responsibility
  – Understanding of leadership and role of a team leader
  – Teamwork both internally and externally to a design team
Sharing general feedback from breakouts

Beyond feedback on professionalism skills, we’d like your thoughts on the following questions:

• How are we doing overall?
• Are students equipped with the skills they need to seamlessly transition into the workplace?
• What are the strengths, weaknesses of the teams you observed?
• Which projects stand out, and what makes them great?
• How can we improve?
Instructions for Judging Teams

Please use Qualtrics survey link that Andrea shared with you to evaluate each team

1. Open survey.
2. Enter the team number.
3. Enter your name.
4. Questions 1-5 align with the judging rubric from previous years. Click the rating from 0-2 that best corresponds with your assessment.
5. Click the arrow at the bottom of the page to submit.
6. Close the survey.
7. Open a new survey using the same link. Repeat the process until you’ve completed all four judging rounds.
Screenshot of Survey

Team Number

Your Name

1. Global and cultural awareness and adaptability

0-Unacceptable: Does not identify any global or cultural relevance of their project

1-Developing: With prompting, identifies one or more aspects of design or role that is globally or culturally affected

2-Exceptional: Identifies global and/or cultural aspects of role or project, and how those aspects were (or could be) included in their design

2. Ability to communicate effectively
Plan for Breakouts

• The meeting host will help you move in and out of breakout rooms to judge your assigned teams
  ➢ Watch for prompts on your screen to move between rooms
  ➢ The host will also give you a warning when each 20-minute session is coming to a close

• Please return from the break promptly at 9:20 a.m.
BREAK
Return by 9:20 a.m.
Transition to Breakout Rooms
Report Back on Breakout Sessions

Facilitator: Steve Pacheco
Sharing Feedback

In addition to hearing your thoughts on students’ professionalism skills, we’d like your feedback on the following questions:

• How are we doing overall?
• Are students equipped with the skills they need to seamlessly transition into the workplace?
• What are the strengths, weaknesses of the teams you observed?
• Which projects stand out, and what makes them great?
• How can we improve?
Closing Remarks

Tony Maciejewski