2018 ASEE Annual Conference Program

ASEE 2018
ANNUAL CONFERENCE
FINAL PROGRAM

June 24 - 27, 2018
Salt Lake City, Utah
Salt Palace Convention Center
What Will YOU Build?
Welcome to Salt Lake City, Utah—Home to the 125th ASEE Annual Conference and Exposition

I am pleased to welcome you to Salt Lake City and the 2018 ASEE Annual Conference and Exposition, where we are celebrating 125 Years at the Heart of Engineering Education! In addition to a beautiful setting, Utah provides an ideal venue for our event. The state is of course the home of Promontory Summit, where the country’s first transcontinental railroad was completed, and the Bonneville Salt Flats, where engineers—including some of our students—compete for land speed records. In addition, numerous colleges of engineering are doing great things here in the Beehive State.

I have the incredible honor of being ASEE’s President as we head into a year of celebrating 125 Years at the Heart of Engineering Education. During this conference and the year to follow there will be opportunities to consider the Society’s place in the engineering education community—why have we persisted and remained relevant; what have been our successes and contributions; how do we remain a force for years to come; and more. I hope you will be able to join us at the Monday plenary, where an acting troupe will whisk us back to 1893 on a journey with ASEE through the years. And please stop by our 125th Anniversary (it’s a quasquicentennial, I’m told) Booth in the Exhibit Hall for historical information and merchandise adorned with our special 125th Anniversary logo.

Broadening participation in engineering has been a central theme of my career and I’ve continued that during my year as President. Here at the conference you’ll find evidence of the Society’s commitment to this important goal, through multiple Safe Zone workshops, several sessions with diversity themes, our Best Diversity Papers, and more. One might imagine that in 1893, when the Society was created, those men at the table would have a hard time believing that, 125 years later, the organization’s annual conference would be as diverse as it is.

The ASEE Annual Conference and Exhibition is the product of a lot of hard work by hundreds of people. I want to thank our sponsors and exhibitors; the people in various leadership positions throughout the membership; those who have created content for the next several days; ASEE Executive Director Norman Fortenberry and the headquarters staff who work to create this event; and, of course, all the attendees who make this event a priority in their schedule and budget.

The conference is an energizing and enriching opportunity for us to exchange ideas, learn from each other, meet old friends, and make new ones. When I leave the conference I’m typically bursting with ideas and enthusiasm, ready to get back to my campus and implement what I’ve taken away. I trust this year’s conference will have the same impact on you. Have a good time, learn a lot, and work to continue a legacy that’s been 125 years in the making.

Sincerely,
Bevlee A. Watford
ASEE President 2017-2018
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### Plan your Annual Conference with the INTERACTIVE CONFERENCE PLANNER

- Get Upcoming Highlights & Hours
- Find Sessions
- Contact Attendees

[www.asee.org/icp](http://www.asee.org/icp)
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Executive Director
Norman L. Fortenberry
American Society for Engineering Education

Schedule subject to change: Please go to www.asee.org/icp for up to date information
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<tr>
<th>Saturday, June 23</th>
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<tr>
<td><strong>Registration Open</strong> - 4:00 pm - 7:00 pm</td>
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<td><strong>Registration Open</strong> - 7:00 am - 5:00 pm</td>
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<td><strong>Exhibit Hall Open</strong> - 5:45 pm - 7:15 pm</td>
<td><strong>Exhibit Hall Open</strong> - 9:30 am - 6:00 pm</td>
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<td><strong>ASEE Executive Committee Meeting</strong></td>
<td><strong>Finance Committee Meetings</strong></td>
<td><strong>Monday Plenary</strong> - 8:00 am - 9:30 am</td>
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<td><strong>ASEE Finance Committee Meeting</strong></td>
<td><strong>ASEE Board of Directors Meeting</strong></td>
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<td>10:00 am - Noon</td>
<td>9:30 am - Noon</td>
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<td><strong>ASEE Executive Committee Meeting</strong></td>
<td><strong>Greet the Stars! - New Members and First Time Attendees Lunch</strong></td>
<td><strong>Technical Session &amp; Business Meeting</strong> - 11:30 am - 1:00 pm</td>
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<td>Noon - 1:00 pm</td>
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<td><strong>ASEE Long Range Planning</strong></td>
<td><strong>Technical Session Only</strong></td>
<td><strong>Technical Session &amp; Business Meeting</strong> - 1:30 - 3:00 pm</td>
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<td><strong>ASEE Diversity &amp; P12 Committee Meetings</strong></td>
<td><strong>Technical Session Only</strong></td>
<td><strong>Technical Session &amp; Business Meeting</strong> - 3:15 pm - 4:45 pm</td>
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<tr>
<td><strong>Taste of Salt Lake</strong></td>
<td><strong>ASEE Board of Directors Meeting Continued</strong></td>
<td><strong>Focus on Exhibits Summertime Social</strong> - 5:00 pm - 6:00 pm</td>
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<td>6:00 pm - 9:00 pm</td>
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<td><strong>Complimentary for All Attendees</strong></td>
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<td><strong>Division Mixer</strong></td>
<td><strong>Focus on Exhibits Welcome Reception</strong></td>
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<td>4:30 pm - 6:00 pm</td>
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Schedule subject to change: Please go to [www.asee.org/icp](http://www.asee.org/icp) for up to date information.
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<tr>
<th>Tuesday, June 26</th>
<th>Wednesday, June 27</th>
<th>Thursday, June 28</th>
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<tbody>
<tr>
<td>Registration Open - 8:00 am – 5:00 pm</td>
<td>Registration Open - 8:00 am – 3:00 pm</td>
<td>ASEE Board of Directors Retreat 8:30 am – 3:00 pm</td>
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<td>Exhibit Hall Open - 8:00 am – 3:00 pm</td>
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<tr>
<td>Technical Session &amp; Business Meeting 8:00 am – 9:30 am</td>
<td>Technical Session &amp; Business Meeting 8:00 am – 9:30 am</td>
<td>2017/2018 ASEE Board of Directors Meeting 7:30 am – 9:30 am</td>
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<tr>
<td>Tuesday Plenary - Best Paper Recognition &amp; CMC Industry Speaker 9:45 am – 11:15 am</td>
<td>Distinguished Lecture 9:45 am – 11:15 am</td>
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<td>Focus on Exhibits Lunch &amp; ASEE Division Poster Sessions - 11:30 am – 1:00 pm</td>
<td>Technical Sessions &amp; Business Meetings 11:30 am – 1:00 pm</td>
<td>ASEE New Program Chair Orientation 1:15 pm – 2:45 pm</td>
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<td>Technical Session &amp; Business Meeting 1:30 pm – 3:00 pm</td>
<td>CMC Industry Day Technical Session - 1:30 pm – 3:00 pm</td>
<td>ASEE Annual Awards Luncheon 11:30 am – 1:00 pm</td>
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<tr>
<td>Technical Session &amp; Business Meeting 3:15 pm – 4:45 pm</td>
<td>CMC Industry Day Technical Session - 3:15 pm – 4:45 pm</td>
<td>Interdivisional Town Hall 3:15 pm – 4:45 pm</td>
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<td>NEW ASEE Member General Body Meeting - 3:15 – 4:45 pm</td>
<td>Technical Session &amp; Business Meeting 3:15 pm – 4:45 pm</td>
<td>ASEE President’s Farewell Reception &amp; International Forum Poster Presentations 5:00 pm – 7:00 pm</td>
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<tr>
<td>Division Business Meetings Only (Optional) - 7:00 am – 8:00 am</td>
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<tr>
<td>Division Social Events (Optional)</td>
<td>Institutional Council Reception (by Invitation Only) 7:00 pm – 8:30 pm</td>
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Schedule subject to change: Please go to [www.asee.org/icp](http://www.asee.org/icp) for up to date information
S1109A: Utah State University - College of Engineering Facilities Tour

Date: Saturday, June 23, 2018
Location: Utah State University
Time: 8:00 a.m. – 5:30 p.m.

Free ticketed event

Join us in beautiful Cache Valley for a tour of Utah State University’s world-renowned Utah Water Research Laboratory (UWRL) and state-of-the-art Electric Vehicle & Roadway (EVR) Research Facility and Test Track. At the UWRL, participants will get an up-close tour of our hydraulics modeling facilities and the 1:50 scale model of the Oroville Dam spillway that was built in the wake of last year’s spillway failure. We’ll also showcase our innovative AggieAir UAS program which is leading the conversation about remote sensing and precision agriculture. At our EVR facility, researchers are developing technologies that will make sustainable electrified transportation a reality. Participants will get a behind-the-scenes tour and take a ride around our quarter-mile electrified test track in an all-electric bus that charges inductively through wireless power transfer while in motion.

Tentative schedule:
Saturday, June 23
8:30: Bus departs Salt Lake City
10:00: Arrive at Utah Water Research Lab
10:05: Water Lab welcome and overview
10:15: Overview and tour of Oroville spillway model
11:00: Presentation on AggieAir UAS program
11:20: Tour nearby SMASH Lab
11:45: Lunch at Herm’s Inn on Canyon Road
1:30: Tour bus arrives at USU’s Electric Vehicle and Roadway facility for tour and in-motion charging demonstrations.
2:45: Bus departs for Salt Lake City

S152: 2018 Community Service Activity: Community Garden for Salt Lake City Refugees

Date: Saturday, June 23, 2018
Location: Bennion Center, University of Utah
Time: 12:00 p.m. – 4:00 p.m.

Ticket: $25

Coordinated by the ASEE Community Engagement Division and the Bennion Center at the University of Utah, this project will give ASEE participants the opportunity to develop a community garden with a nearby refugee community.

While many refugees have become integral members of the Salt Lake City community, they miss their foods from home. Gardens provide not only a source of pride for the community but also food that is not locally available.

The project will consist of four hours of work clearing land, building garden boxes, installing drip lines, and planting seeds. Through this event, we hope to provide an educational experience related to community engagement in addition to providing some service to our host city. Additionally, participants can learn from the Bennion Center and their successful projects.

S496A: Utah Olympic Park Bobsled Tour

Date: Saturday, June 23, 2018
Location: Utah Winter Olympics Sports Park
Time: 1:00 p.m. – 4:00 p.m.

Buses will depart from the South Entrance of the Salt Palace Convention Center

Description: Free Ticketed Event
Visit the Utah Winter Olympics Sports Park (https://utah.com/utah-olympic-park) near picturesque Park City with the designers of the bobsled and luge track, who will discuss the design and construction of this Olympic venue.

S496B: UDOT Tour

Date: Saturday, June 23, 2018
Location: Utah Department of Transportation Operations Center
Time: 1:00 p.m. – 4:00 p.m.

Buses will depart from the South Entrance of the Salt Palace Convention Center

Description: Free Ticketed Event
You will visit the Utah Department of Transportation Operations Center (https://www.coe.utah.edu/traffic-center/), where Utah Department of Transportation leaders will describe technologies—including Rapid Bridge Replacement, Innovative Intersections, Connected/Autonomous Vehicles, and Traffic Signal Management—in which UDOT has become a national leader.

S196: University of Utah Campus Tour

Date: Saturday, June 23, 2018
Time: 1:00 p.m. – 5:00 p.m.

Buses will depart from the South Entrance of the Salt Palace Convention Center

Free Ticketed Event
Join us for a brief tour of the University of Utah campus including stops at Blackrock Microsystems in Research Park, an entrepreneurial dormitory with 20,000 square feet of shop space, and the USTAR Research Building.

S796: BACK BY POPULAR DEMAND: The Taste of Salt Lake City

Date: Saturday, June 23, 2018
Location: Salt Palace Convention Center, South Foyer
Conference Highlights

Time: 6:00 p.m. – 9:00 p.m.
Free ticketed event
This event will feature food from local restaurants, local attractions, and games, giving all a taste of what Salt Lake has to offer.
• Be entertained by LED Ballerinas, stilt walkers, magicians and caricature artists.
• Discover exotic birds with Tracy Aviary.
• Taste such local favorites as Waffle Luv, Fat Kid Mac & Cheese, Chedda Burger, and many more.
• Local beer and wine tastings with Squatters Craft Beer and Castle Creek Moab Winery.
A special event for all to enjoy!

ASEE’s Living Wall

Date: Saturday, June 23 - Wednesday, June 27, 2018
Location: Salt Palace Convention Center, Foyer
Time: Available during registration hours

We’re excited to announce the return of the ASEE Living Wall. Each year at the conference, attendees will contribute their thoughts to the wall by writing a response to a particular question or idea. The wall will be preserved and displayed from year to year, growing bigger and serving as an historical document of our conference attendees’ insights, ruminations, and reflections.

We hope you’ll take a few moments to leave your legacy on the Living Wall.

U296, M196B, T196A, W196A - ASEE Active!
Sunrise Gentle Yoga

Date: Sunday, June 24 - Wednesday June 27, 2018
Location: Salt Palace Convention Center
Time: 7:00 a.m. – 7:45 p.m.

Join your friends and colleagues as we jump-start our day with a renewing stretch and meditation class—no mat or exercise clothes required!

SUNDAY WORKSHOPS

Date: Sunday, June 24, 2018
Location: Salt Palace Convention Center
Time: 9:00 a.m. – 12:00 p.m.

The ASEE Annual Conference workshops have been moved to Sunday!

Disruptive technology and teaching with the Internet of Things are among the workshops from divisions such as the ERM, New Engineering Educators Division, Liberal Education/ Engineering & Society Division, Design in Engineering Education Division, Biomedical Division, Continuing Professional Development Division, and many others. Be sure to check them out!

U396 – GREET THE STARS! New Members and First-Time Attendees Luncheon

Date: Sunday, June 24, 2018
Location: Salt Palace Convention Center

Time: Noon - 1:00 p.m.
Ticketed event, by invitation only
Are you a new ASEE member or first-time Annual Conference attendee? Join your friends, colleagues, and the ASEE Board of Directors at this special luncheon, where we will discuss an overview of the conference and benefits of membership.
Anyone who joined ASEE for the first time since January 1, 2018 and/or is a first-time Annual Conference attendee is eligible to attend.

U696 - ASEE Division Mixer
SPONSORED BY UNIVERSITY OF UTAH

Date: Sunday, June 24, 2018
Location: Salt Palace Convention Center, Grand Ballroom
Time: 4:30 p.m. - 6 p.m.

One of our most popular events!
The Division Mixer kicks off the conference with music, drinks, food, and camaraderie. This event is both a networking opportunity and a chance for divisions to showcase and promote themselves to prospective members. Tables staffed by participating divisions may feature contests and prize giveaways.
This event is complimentary for all attendees.

U796, M296A,T196B - Back by Popular Demand:
Virtual Reality Experience

Date: Sunday, June 24 – Tuesday, June 26, 2018
Location: Exhibit Hall, Salt Palace Convention Center

Get immersed in the latest Virtual Reality experience at four stations in the back of the Exhibit Hall.
Limit: 15 minutes per person.

U796B - Focus on Exhibits: Welcome Reception

Date: Sunday, June 24, 2018
Location: Exhibit Hall, Salt Palace Convention Center
Time: 6:00 p.m. - 7:30 p.m.

Join your colleagues at the Grand Opening of the Exhibit Hall, immediately following the Division Mixer. Our exhibit hall is packed with exciting products, solutions, and technologies, with new and captivating content year after year. Roam the expansive space while enjoying refreshments, catching up with old friends, and making new ones.
This event will feature complimentary beer, wine, and refreshments and is free for all attendees.

M96 & T96 - ASEE Active! Group Walk/ Run Event

Date: Monday, June 25 and Tuesday, June 26, 2018
Location: East Doors, Salt Lake Palace Convention Center
Time: 6:30 a.m. - 7:30 a.m.
Free ticketed event
Looking for people to run or walk outdoors with? Don’t know the local scene?
Conference Highlights

Meet up with your colleagues at the east doors of the Salt Palace Convention Center (West Temple and 200 South) at 6:30 a.m. and we’ll head out on a group run/walk highlighting the State Capitol Building, Memory Grove Park, and City Creek Canyon. Pace and distance will be determined based on attendee preference; there will be at least one walking group and one running group available. All runners and walkers are welcome!

ASEE Active! is endorsed by the Ad Hoc Committee for Interdivisional Cooperation and the Connecting Us Team of the ASEE Board’s Strategic Doing initiative, and is focused on building community among ASEE members through participation in healthy recreational activities.

M193 – ASEE Monday Plenary
Sponsored by University of Maryland
Date: Monday, June 25, 2018
Location: Grand Ballroom A-H
Time: 8:00 a.m. – 9:30 a.m.

Sponsored by the University of Maryland
Join your friends and colleagues at our annual Monday Plenary. In recognition of our “125 Years at the Heart of Engineering Education,” a dramatic representation of ASEE through the years will be presented by an acting troupe directed by Jeffrey Steiger, who is known for his unique theatrical presentations of academe-themed issues.

Keynote Address:

Pierre Haren, Founder and CEO, Causality Link

Pierre Haren is a graduate of the École Polytechnique in France and holds an M.S. and Ph.D. from the Massachusetts Institute of Technology. He led a research team at INRIA, the French National Institute for Research in computer science and applied mathematics, on the design of expert systems in the 1980’s, then created ILOG in 1987, took it public on NASDAQ in 1997, and sold it to IBM in 2008. After integrating ILOG into IBM, he joined GBS, the consulting arm of IBM, and for two years served as Vice President, Advanced Analytics and Cognitive, before creating Causality Link, a Utah-based predictive analytics company that uses artificial intelligence machine learning, and big data to help clients make better investment decisions. Across his career, Haren has led and mentored diverse teams of researchers and consultants, and introduced on the market and deployed at customer sites a variety of products, from expert systems to Advanced Graphical User Interfaces and operations research as well as Watson technologies in IBM.

He is passionate about Explicit Artificial Intelligence, at the convergence of knowledge engineering and advanced software, where knowledge representations can be understood by experts and leveraged by computers. He cannot wait to show you how the Causality Link team embodies these concepts in finance.

M296C - Focus on Exhibits: Brunch & NSF Grantees Poster Session
Date: Monday, June 25, 2018
Location: Exhibit Hall, Salt Palace Convention Center
Time: 9:45 a.m. – 11:15 a.m.

Our exhibitors welcome you back for food and drink to start the day. Whether it’s a NASCAR, 3-D printer, or quality textbooks for your classes, you’ll likely find something interesting in the Exhibit Hall. This event is complimentary for all attendees.

M696 - Focus on Exhibits: Summertime Social
Date: Monday, June 25, 2018
Location: Exhibit Hall, Salt Palace Convention Center
Time: 5:00 p.m – 6:00 p.m.

Nothing says summer like a refreshing glass of sweet, cold lemonade. Escape the hot June temps and see what’s “hot” on the Exhibit Hall Floor. This event is complimentary for all attendees.

T293 - Tuesday Plenary
Date: Tuesday, June 26, 2018
Location: Grand Ballroom A-H
Time: 9:45 a.m. - 11:15 a.m.

Join your friends and colleagues as we recognize the winners of the 2017 Best Overall PIC Paper, Best Overall Zone Paper, and Best Diversity Paper!

BEST OVERALL PIC PAPER: PIC V Paper: Exploring School-to-work Transitions through Reflective Journaling
Authors: Benjamin Lutz and Marie Paretti, Virginia Tech

BEST OVERALL ZONE PAPER: ZONE IV Paper: Assessment of Long-Term Effects of Technology Use in the Engineering Classroom
Author: Sean St. Clair, Oregon Institute of Technology

BEST DIVERSITY PAPER: The Inequality of LGBTQ Students in U.S. Engineering Education: Report on a Study of Eight Engineering Programs
Authors: Erin Cech, University of Michigan; Tom Waidzunas, Temple University; Stephanie Farrell, Rowan University

Corporate Member Council Industry Day Keynote Speaker

George Siemens
Professor and Executive Director
Learning Innovation & Networked Knowledge Research Lab
University of Texas, Arlington

George Siemens researches technology, networks, analytics, and openness in education. Leading the development of the Center for Change and Complexity in Learning (C3L) at the University of South Australia, he has delivered keynote addresses in more than 35 countries on the influence of technology and media on education, organizations,
and society. His work has been profiled in provincial, national, and international newspapers (including the New York Times), radio, and television. He has served as principal investigator or co-PI on grants totaling more than $15 million, with funding from NSF, SSHRC (Canada), Intel, Boeing, the Bill and Melinda Gates Foundation, and the Soros Foundation. He has received numerous awards, including honorary doctorates from Universidad de San Martín de Porres and Fraser Valley University for his pioneering work in learning, technology, and networks. He holds an honorary professorship with University of Edinburgh.

Dr. Siemens is a founding President of the Society for Learning Analytics Research (http://www.solaresearch.org/). He has advised government agencies in Australia, the European Union, Canada, and United States as well as numerous international universities on digital learning and utilizing learning analytics for assessing and evaluating productivity gains in the education sector and improving learner results. In 2008, he pioneered massive open online courses—sometimes referred to as MOOCs.

He blogs at http://www.elearnspace.org/blog/ and on Twitter: @gsiemens

T396A - Focus on Exhibits: Lunch and ASEE Division Poster Sessions

Date: Tuesday, June 26, 2018
Location: Exhibit Hall, Salt Palace Convention Center
Time: 11:30 a.m. - 1:00 p.m.
ASEE Division Poster Sessions are available for perusing over lunch. And if there’s a booth you’ve yet to explore, this closing Exhibit Hall session will be your last chance.
This event is complimentary for all attendees.

Diversity Roundtables - T496A, T496B, T496C, T596A, T596B & T596C
As part of ASEE’s ongoing activities in support of a diverse and inclusive environment for all members, this year’s Annual Conference includes several Special Interest Group (SIG) working sessions. Their purpose is to facilitate open dialogue and conversation, allowing participants to discuss how ASEE can support engineering education, relevant diversity research, and engagement of this community in society activities. A team of facilitators will help guide the discussion, and the output of each session will be a set of recommendations to the ASEE Board of Directors for consideration and integration into the activities of the Society.

T496A·LGBTQ Leadership Roundtable
Date: Tuesday, June 26, 2018
Location: Salon A, Marriott at City Creek
Time: 1:30 p.m. - 3:00 p.m.
This working session will focus on issues relevant to the LGBTQ+ community.

T496B·First-Generation/SES Leadership Roundtable
Date: Tuesday, June 26, 2018
Location: Salon B, Marriott at City Creek
Time: 1:30 p.m. - 3:00 p.m.
This working session will focus on issues relevant to the community of first-generation college goers and low socioeconomic status students.

T496C·Persons with Disabilities Leadership Roundtable
Date: Tuesday, June 26, 2018
Location: Salon C, Marriott at City Creek
Time: 1:30 p.m. - 3:00 p.m.
This working session will focus on issues relevant to the community of students and faculty with disabilities.

T596A·Non-Tenure Track Faculty Leadership Roundtable
Date: Tuesday, June 26, 2018
Location: Salon C, Marriott at City Creek
Time: 3:15 p.m. - 4:45 p.m.
This working session will focus on issues relevant to faculty who are in non-tenure track positions.

T596B·Military Veterans Leadership Roundtable
Date: Tuesday, June 26, 2018
Location: Salon A, Marriott at City Creek
Time: 3:15 p.m. - 4:45 p.m.
This working session will focus on issues relevant to the military veterans’ community.

T596C·Graduate Students Leadership Roundtable
Date: Tuesday, June 26, 2018
Location: Salon B, Marriott at City Creek
Time: 3:15 p.m. - 4:45 p.m.
This working session will focus on issues relevant to the community of graduate students interested in engineering education.
As ASEE reaches the age of 125, we have an opportunity to look back over the broad range of the Society’s activities and, drawing from that experience, project where we might go in the future. What have been our successes? Where might we have done better? How might we do better in the years to come? In this session, a panel of eminent ASEE members will address these questions in three specific areas of ASEE endeavor.

Moderator: Lyle D. Feisel, P.E. (Ret.) is Dean Emeritus of the Thomas J. Watson School of Engineering and Applied Science at SUNY Binghamton.

Following service in the U.S. Navy, he received B.S., M.S., and Ph.D. degrees in electrical engineering from Iowa State University. From 1964 to 1983, he was a member of the faculty of the South Dakota School of Mines and Technology, serving as head of the department of electrical engineering from 1975 to 1983. He served as the founding dean of engineering at SUNY Binghamton from 1983 to 2001. Feisel has held many positions in ASEE, including President in 1997-98 and interim Executive Director in 2010-11. He is currently chair of the Prism Editorial Advisory Board and is a Fellow of ASEE and NSPE and a Life Fellow of the IEEE. He is an active volunteer in ASEE, IEEE, and his community on Maryland's Eastern Shore. Feisel is the author of Lyle’s Laws, for 10 years a regular column in the Bent of Tau Beta Pi and now collected as Lyle's Laws published by Brooklyn River Press.

Stephanie Adams. Dean of Engineering at Old Dominion University, will discuss the impact of ASEE on the direction of the engineering curriculum, particularly through the various reports that have been developed by the Society. Her presentation will include an outline of the history of those reports and the effect they have had on what is taught in an engineering program. ASEE’s participation in the activities of ABET will also be discussed, along with some prediction of any changes in the future.

Donna Riley, head of Purdue University’s School of Engineering Education, will consider the history of diversity in engineering education, recalling a time when women and minorities were a rarity in engineering or on the faculties of engineering schools. Her presentation will trace ASEE’s efforts to alleviate some of this disparity and present information on how the makeup of the engineering workforce has changed over the years. She also will offer her thoughts and insights on what ASEE and the profession can do in this area in the future.

Karl Smith, University of Minnesota professor emeritus and Cooperative Learning Professor of Engineering Education, Purdue University, will note that engineering faculty have not always been interested in the theory of teaching and learning—indeed, many are still not—but that the situation has changed somewhat over the years. His presentation will revisit the days when educational research and methods were only beginning to have an impact, and map the progress of the art and science of teaching in engineering and the contributions made to that progress by ASEE. He will also look into the future with suggestions of what we might expect in the years ahead.
The idea that engineering makes a positive contribution to human wellbeing is a central aspect of engineering identity and a particularly important motivation to current undergraduate engineering students. The Grand Challenges put forward by the National Academy of Engineering, for example, take as their foundation the belief that the 20th century was a time in which “engineering revolutionized and improved virtually every aspect of human life.” From a historical perspective, however, the relationship between engineering and social justice is complicated, particularly to the extent that engineers work for employers and their clients under the demands of business environments. Deborah G. Johnson, one of the leading experts in engineering ethics, has recently suggested that the social responsibility of engineers should be understood not as the product of a social contract between the profession and society, but rather as a form of accountability in which engineers and the organizations of which they are a part assume obligations to explain and justify behavior and share norms regarding what needs to be explained, what counts as an adequate explanation, and what consequences might follow. As Johnson aptly points out, "Engineers are not required to explain or justify their behavior to publics until something goes wrong or until engineers—in the act of whistleblowing—bring something to the attention of a public." Johnson urges us to pay attention to the ways in which the “social responsibilities of engineers are constructed and manifested through concrete practice in which norms and expectations are manifested and enforced.” The integration of engineering ethics with the perspectives of Science, Technology, and Society (STS) provides a framework for understanding the interaction between norms, expectations, and practices. In this lecture, Johnson will provide a roadmap for such integration.

Access to traditional prosthetics for children is challenging due to high costs, health-care policies, and technology limits. A local family contacted Albert Manero while he was a doctoral engineering student at the University of Central Florida (UCF) about a six-year-old named Alex Pring who was born without most of his right arm. Alex performed daily activities by making use of his left hand and his mom’s assistance. His family wanted to buy a prosthetic, but the high cost and accessibility challenges made that not feasible. Alex’s mom connected with Manero. Working with a passionate team of engineers and designers, they created a 3-D-printed electromyographic arm for Alex, and Limitless Solutions was born. Limitless Solutions is a nonprofit direct support organization at UCF designing affordable bionic arms for children at no cost to families. Dr. Manero and his team advise research and design teams at UCF to improve access to bionics and to conduct research to advance empowerment technology. Engaging with local K-12 schools to promote the social impact that engineering is capable of, the team is looking to develop a more inclusive and creative engineering landscape for the future. Limitless Solutions has received extensive national recognition for its work, including being featured as part of Microsoft’s Collective Project.
There is near universal consensus that paying attention to diversity and inclusion is beneficial for student, staff, and faculty engagement and organizational success. Often, organizations employ mentoring programs to effect inclusion, or to help promote diversity within the organization. Rarely, however, do participants in these mentoring initiatives understand how much difference in culture, background, and perspective can impact the mentoring relationship or how to leverage those differences to maximize the effectiveness of mentoring. In this session, Deborah Besser, director of the Center for Engineering Education at the University of St. Thomas, will introduce a model of cultural competency, create deeper understanding of the pillars of culture, and offer concrete strategies on how to leverage differences to create understanding, trust, and results in mentoring.

W393 - ASEE Annual Awards Ceremony and Lunch
SPONSORED BY UNIVERSITY OF BOEING COMPANY & DASSAULT SYSTEMES
Date: Wednesday, June 27, 2018
Location: Salt Palace Convention Center, Grand Ballroom I
Time: 11:30 a.m. - 1:00 p.m.
ASEE offers awards in a variety of areas, from best paper, to teaching recognition, to professional and technical honors, to a lifetime achievement award. This event showcases some of ASEE’s best and brightest.

Award winners and their guest are complimentary; all others can attend for $50.

W396 - INTERNATIONAL FORUM: Luncheon & Keynote Speaker
Date: Wednesday, June 27, 2018
Location: Salon E, Marriott at City Creek
Time: 11:30 a.m. - 1:00 p.m.
Ticketed event: $75 advanced registration and $85 on-site registration

W496A - ASEE 2019 Program Chair Orientation
Date: Wednesday, June 27, 2018
Location: Salt Palace Convention Center
Time: 1:30 p.m. - 3:00 p.m.
First-time program chairs and also continuing program chairs are encouraged to attend this orientation to introduce new program chairs to Monolith and the process and procedures for managing papers and sessions for the 2019 ASEE Annual Conference in Tampa, Fla. We welcome your feedback and good ideas.

This meeting is conducted by ASEE’s Conferences Director.

W596B - INTERNATIONAL FORUM: Technical Session II
Date: Wednesday, June 27, 2018
Location: Salon E, Marriott at City Creek
Time: 1:30 p.m. - 4:45 p.m.
International Forum Technical Session II

W793 - ASEE President’s Farewell Reception & International Forum Poster Presentations
SPONSORED BY DASSAULT SYSTEMES
Date: Wednesday, June 27, 2018
Location: Salt Palace Convention Center, Ballroom A-H
Time: 6:00 p.m. - 7:30 p.m.
Join your friends and colleagues as we say farewell to Salt Lake City and ASEE President Bevlee Watford while passing the gavel to President-Elect Stephanie Farrell and looking forward to next year’s Annual Conference in Tampa, Fla.
This session will also feature the Poster Board Presentations from the International Forum.

R196 - COMMERCIALIZING ENGINEERING RESEARCH WORKSHOP
Date: Thursday, June 28, 2018
Location: Sorenson Molecular Biotechnology Building, University of Utah
Time: 8:00 a.m. - 4:00 p.m.
Learn how to build an entrepreneurial ecosystem that supports the commercialization of university engineering research, including discussions of policies and practices related to the commercialization office, conflict of interest, promotion and tenure, faculty and student engagement, entrepreneurial sabbaticals, academic entrepreneurship programs, entrepreneurial housing, growing an investment community, conflict of commitment, and other challenges related to commercialization.

Keynote Speaker: Ross DeVol, Walton Family Foundation, formerly at the Milken Institute
School, Miami, Fla.

Our team mostly focuses on the research, development, sales, and marketing of innovative technology surrounding industrial applications, businesses, military, and other areas where ruggedness, redundancy, reliability, and scalability are required. Hans Rueckcschat (Head Designer) is the main designer focused on research and development of new projects. He is also one of two business strategists in the team. Alex Cordero (Business Strategist) is the main business strategist focused on marketing and sales. Jesus Capo (researcher, writer, and designer) is one of the designers in the group and also one of the team’s main researchers. Christopher Perez (field tester and designer) is a certified pilot and helps the team in building prototypes, making a large impact on the designs. David Perez (programmer) is the team’s lead programmer and he develops most of the test programs and scripts for the project. We participated in the Conrad Spirit of Innovation Challenge in NASA’s Kennedy Space Center, where we won against 40 teams from around the world, including China, Australia, and India. We were named Pete Conrad Scholars, the highest honor given in the competition. Our winning project was called the Mini Blackbox. Its purpose is to provide rugged and mobile capabilities to high-performance computing, with applications such as servers, workstations, and other computing solutions. The project led to the development of a reliable, rugged, effective, efficient, and scalable process that improved the compatibility and interface between most types of electronic equipment and our protective enclosure.

My name is Jake Uyechi, a Native Hawaiian student from Kamehameha Schools hoping to major in chemical or electrical engineering. I am currently investigating the lo‘i kalo (taro patch) and the use of the mud in a sediment-based microbial fuel cell (MFC). The kalo (taro crop) is the root of Hawaiian culture—it was a widely cultivated and prized staple food in ancient Hawaii. However, many of these taro patches are historical or cultural sites, and taro farmers do not have access to the power grid. My project focused on generating sustainable energy from Kamehameha Schools in the spring of 2017. I currently run an engineering design and prototyping company and am also the head of technology for a start-up biotech company.

I competed in the American Society of Mechanical Engineers’ (ASME) Old Guard Oral Presentation competition. I won both the National EFest competition located at Tennessee Tech and the International Mechanical Engineering Congress and Exposition (IMECE) at the Tampa Convention Center. At IMECE, I also won an additional award for “best innovation.”

I created a system that allows the creation of mechanically changing polymer gradients. This allows a single continuous polymer material to have multiple mechanical properties throughout. Having this ability allows biomedical labs to test various cell properties along the entire length of a material without having to make separate samples. It also allows the creation of unique structures that would normally require multiple materials.

Since then, the team has won first place at our local Grove City Competition eight times. The team has won first place at the regional competition at Auburn, Ala., once and at Fargo, N.D., twice. Currently, our high school has 89 students, of whom 34 are on the robotics team. But our team is not only high school. We take pride in the fact that we have middle school students on our team, and we actively mentor the next generation of engineers. 65 percent of our high school graduates go on to pursue engineering careers, showing just how integral BEST Robotics has been to exposing students to lifelong career choices. BEST Robotics has many different ways for students to display and practice their talents: designing the marketing booth, informal and formal marketing presentations, writing an engineering notebook, designing and building the robot, programming the robot, and making video games.
Did you know…

• 1 in 5 LGBTQIA+ (lesbian, gay, bisexual, transgender, queer/questioning, intersex, asexual) students fear for their physical safety on college campuses?
• 1 in 3 LGBTQIA+ students is made to feel uncomfortable in our classrooms?
• LGBTQIA+ engineering students are more likely than women, underrepresented minorities, and non-LGBTQIA+ peers to report a chilly climate?
• STEM departments are lagging way behind other disciplines in the adoption of LGBTQIA+-inclusive practices?

You can help change this! Safe Zone Ally Training is a series of interactive workshops for students, faculty, and the professional community during which participants will build the knowledge and skills needed to create a more inclusive and affirming environment for LGBTQIA+ individuals in engineering. The workshops have been developed by a community of science and engineering professionals and students, specifically for a STEM audience.

Safe Zone Level 1 focuses on understanding LGBTQIA+ concepts and the coming out process, responding to bias, and adopting simple strategies for building an inclusive environment.

Safe Zone Level 2 discusses aspects of engineering culture that act as barriers to LGBTQIA+ equality, explore heterosexual and cisgender privilege, and learn to recognize bias and disrupt discrimination.

The Deep Dive LGBTQIA+ Inclusion workshop focuses on creating a supportive and inclusive environment for transgender students and colleagues.

Participants in Levels 1 and 2 will receive a Safe Zone sticker to display in their workplace. Digital badges will be awarded for participation in each workshop in the Safe Zone series.

U4112A· Safe Zone Ally Training (Level 1)
Panel · ASEE Diversity Committee, International Division, and Minorities in Engineering Division
Sunday, June 24, 2018, 1:15 p.m. to 2:45 p.m.
Room 150 E, Salt Palace Convention Center

Free ticketed event
Tickets are requested for planning purposes only, so please come, even if you did not sign up in advance.

M3112A· Safe Zone Ally Training (Level 2)
Panel · ASEE Diversity Committee, Minorities in Engineering Division, and International Division
Monday, June 25, 2018 11:30 a.m. to 1:00 p.m.
Room 150 E, Salt Palace Convention Center

Free ticketed event
Tickets are requested for planning purposes only. Please come, even if you did not sign up in advance!
Diversity Sessions

5. Prof. Jonathan D. Stolk - BDP finalist author
6. Ms. Brianna Benedict - BDP finalist author

T1112· Safe Zone Ally Training (Level 1)
Panel · ASEE Diversity Committee and Minorities in Engineering Division
Tuesday, June 26, 2018, 8:00 a.m. to 9:30 a.m.
Room 150 E, Salt Palace Convention Center
Session Description
Free ticketed event
Tickets are requested for planning purposes only. Please come, even if you did not sign up in advance!
Moderator: Dr. Rocio C. Chavela Guerra
Speakers:
1. Dr. Rocio C. Chavela Guerra - American Society for Engineering Education And other ASEE Diversity Committee Ally trainers
2. Dr. Stephanie Farrell - Rowan University, Safe Zone Ally Facilitator
3. Dr. Mahesh Aggarwal - Gannon University, Safe Zone Ally Facilitator
4. Mr. Tiago R. Forin - Rowan University, Safe Zone Ally Facilitator

T5112· Safe Zone Ally Training (Level 2)
Panel · ASEE Diversity Committee, Minorities in Engineering Division, and International Division
Tuesday, June 26, 2018, 3:15 p.m. to 4:45 p.m.
Room 150 E, Salt Palace Convention Center
Free ticketed event
Tickets are requested for planning purposes only, please come, even if you did not sign up in advance.
Moderator: Dr. Rocio C. Chavela Guerra
Speakers:
1. Dr. Rocio C. Chavela Guerra - American Society for Engineering Education And other ASEE Diversity Committee Ally trainers
2. Dr. Joel Alejandro Mejia - University of San Diego, Safe Zone Ally Facilitator
3. Mr. Tiago R. Forin - Rowan University, Safe Zone Ally Facilitator

W4112A· Round Table Conversations on Diversity, Equity, and Inclusion
Panel · ASEE Diversity Committee, International Division, and Minorities in Engineering Division
Wednesday, June 27, 2018, 1:30 p.m. to 3:00 p.m.
Room 150 F, Salt Palace Convention Center
Bring your voice to the table. We will have multiple topics for small groups to discuss, including how to start a difficult conversation about diversity. Come ready to listen, learn, and contribute. We will provide an opportunity to plan for next steps that all can take to support diversity, equity, and inclusion in engineering.

W5112A· Safe Zone Deep Dive: Supporting Transgender Students and Colleagues
Panel · ASEE Diversity Committee, International Division, and Minorities in Engineering Division
Wednesday, June 27, 2018, 3:15 p.m. to 4:45 p.m.
Room 150 E, Salt Palace Convention Center
Free ticketed event
Tickets are requested for planning purposes only! Please come, even if you did not sign up in advance.
Moderator: Dr. Rocio C. Chavela Guerra
Speakers:
1. Dr. Rocio C. Chavela Guerra - American Society for Engineering Education And other ASEE Diversity Committee Ally trainers
2. Mr. Christopher Alexander Carr - National Society of Black Engineers, Safe Zone Ally Facilitator
3. Dr. Linda Vanasupa - California Polytechnic State University, San Luis Obispo, Safe Zone Ally Facilitator
4. Dr. Stephanie Farrell - Rowan University, Safe Zone Ally Facilitator
ABET Sessions

U5116· Listening Session—Academic Advisory Council—NEW!!
Panel · ABET Sponsored Sessions
Sunday, June 24, 2018, 3:00 p.m. to 4:45 p.m.
Room 150 D, Salt Palace Convention Center

Are you aware that ABET has an Academic Advisory Council (AAC)? Did you know that the AAC represents all four ABET commissions? Provosts, deans, and chairs from a variety of institutions across the United States populate the AAC. It is one of three councils that provide recommendations to the ABET board of directors on issues of importance, particularly to the academic community. This listening session will highlight the impactful work of the AAC, review its current initiatives, and invite you to present topics and issues for the AAC to consider working on to make meaningful and helpful changes to ABET processes and practices.

M3116· Accreditation Information Session 2018
Panel · ABET Sponsored Sessions
Monday, June 25, 2018, 11:30 a.m. to 1:00 p.m.
Room 150 D, Salt Palace Convention Center

If you are new to ABET accreditation or have programs that are seeking ABET accreditation for the first time, this session is for you. Topics include what types of programs are accredited, what the accreditation criteria and procedures are, who writes them, who serve as evaluators and how they are assigned to your program, who makes final accreditation decisions and how, how assessment tools are used and misused in the ABET process, and who ABET matters to (and why). Come ready with your questions and feedback for senior ABET representatives.

T1116· How to Lead the Preparation for an On-Site Visit
Panel · ABET Sponsored Sessions
Tuesday, June 26, 2018, 8:00 a.m. to 9:30 a.m.
Room 150 D, Salt Palace Convention Center

Leading the institutional planning and execution for an on-site ABET visit involves creating an infrastructure of support from many groups of stakeholders. This session features a panel representing both the engineering and engineering technology accreditation commissions and institutional representatives who hosted ABET visits during 2017. Best practices from the viewpoints of both program evaluators and institutional representatives will be of interest to institutional representatives and others preparing for on-site visits.

T4116A· Becoming a Program Evaluator Might Be For You!
Panel · ABET Sponsored Sessions
Tuesday, June 26, 2018, 1:30 p.m. to 3:00 p.m.
Room 150 D, Salt Palace Convention Center

Each year, more than 2,000 academic administrators and faculty, industry and government officials, and technical professionals serve as ABET program evaluators, making initial accreditation recommendations and working together to ensure quality in technical education worldwide. This session provides information for prospective ABET volunteers and covers:
1) ABET’s need for new volunteers
2) The nature of program evaluator work
3) What’s in it for you?
4) Threshold requirements for service and the program evaluator selection process
5) Training requirements
6) The program evaluator “life cycle”

T5116A· What’s new at ABET 2018?
Panel · ABET Sponsored Sessions
Tuesday, June 26, 2018, 3:15 p.m. to 4:45 p.m.
Room 150 D, Salt Palace Convention Center

This ABET-sponsored program will share current activities and news with engineering educators. ABET representatives will discuss findings from the Diversity and Inclusion Committee as well as topics that are on the strategy horizon for ABET.
Industry Day Sessions

T1100·INDUSTRY DAY: CMC and CIPD Breakfast
Social · Corporate Member Council and College Industry Partnerships Division
Tuesday, June 26, 2018, 8:00 a.m. to 9:30 a.m.
Salon I, Marriott at City Creek
CMC and CIPD joint breakfast.

T4100·INDUSTRY DAY: The Lifelong Learning Pathway of the Global Engineer
Technical · Corporate Member Council
Tuesday, June 26, 2018, 1:30 p.m. to 3:00 p.m.
Room 151 D, Salt Palace Convention Center
Moderator:
Erica Messinger, Director, Worldwide University Development, Keysight Technologies
Panelists:
Cynthia Murphy-Ortega, Manager, University Partnerships and Association Relations, Chevron Corporation
Howard Appelman, Associate Technical Fellow, Boeing
Ye Cheng, Education Technical Evangelist, MathWorks

T5100A·INDUSTRY DAY: The Twists and Turns of an Engineer’s Career
Technical · Corporate Member Council
Tuesday, June 26, 2018, 3:15 p.m. to 4:45 p.m.
Room 151 D, Salt Palace Convention Center
Moderator:
Cynthia Murphy-Ortega, Manager, University Partnerships and Association Relations, Chevron Corporation
Panelists:
Erica Messinger, Director, Worldwide University Development, Keysight Technologies
Howard Appelman, Associate Technical Fellow, Boeing
Dora Smith, Senior Director, Global Academic Program, Siemens PLM Software

T7100·INDUSTRY DAY: Institutional Council Reception Sponsored by NCEES (By Invitation Only)
Social · Corporate Member Council, Engineering Deans Council, Engineering Research Council, and Engineering Technology Council
Tuesday, June 26, 2018, 7:00 p.m. to 9:00 p.m.
The Utah Science Technology and Research Building,
University of Utah, 36 S Wasatch Dr., Salt Lake City, UT 84112
This reception, hosted by the Engineering Deans Council, Corporate Member Council, Engineering Research Council, and Engineering Technology Council, is by invitation only.

Schedule subject to change: Please go to www.asee.org/icp for up to date information
ASEE would like to acknowledge the generous support of our premier corporate partners. ASEE is proud to work closely with these strategic partners in pursuit of a shared vision to ensure, advance, and promote excellence in all aspects of engineering and engineering technology education.

Join these innovative engineering and technology organizations in showcasing a commitment to furthering excellence in engineering education—become an ASEE annual conference sponsor today!

For more information, please visit www.asee.org or contact Ashley Krawiec, Manager of Event Sales, at 202-649-3838 or a.krawiec@asee.org

Contact the Conferences Department for more information
Follow us on Twitter @ASEEConferences
ASEE would like to thank the following sponsors for their generous support of the 2018 ASEE Annual Conference. Thank you for your commitment to furthering excellence in engineering and engineering technology education.

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UTAH ENGINEERING
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CO-HOST CAMPUS:

UVU College of Engineering & Technology
UTAH VALLEY UNIVERSITY

AFFILIATE CO-HOST:

COLLEGE of ENGINEERING
UtahState University

WEBER STATE UNIVERSITY
Engineering, Applied Science & Technology

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VISIONARY:

EDUCATOR:

MENTOR:

PIONEER:

INNOVATOR:

LEADER:

EDUCATOR:
New This Year! Texas Instruments Robotics Pavilion

Exhibit Hall A, B, and C, Salt Palace Convention Center
Check out TI’s robotics pavilion #1031 for live robotics demos and challenges!
Sunday, June 25 – DSTR Robot from 6 p.m. to 7:30 pm
Monday, June 26 – TI-RSLK from 5 p.m. to 6 p.m.
Tuesday, June 27 – TI-Innovator™ Rover from 11:30 a.m. to 1 p.m.

M1109·SPONSOR TECHNICAL SESSION:
Space-worthy Robotics with TI & Texas A&M DSTR
PRESENTED BY TEXAS INSTRUMENTS
Sunday, June 24, 2018, 1:15 p.m. to 2:45 p.m.
Room 150 A, Salt Palace Convention Center

Speakers: Dr. Joseph A. Morgan, Texas A&M, and Mark Easley, Texas Instruments

Join Texas A&M University for a presentation and demo of their DSTR platform for teaching higher-education robotics. This unique design will be a great addition as a platform to any robotics or mechatronics course and student activities.

Presenters: Dr. Joseph A. Morgan, Texas A&M, and Mark Easley, Texas Instruments
Snacks will be provided

U5109·SPONSOR TECHNICAL SESSION:
Using the FE Exam for Effective Outcomes Assessment
PRESENTED BY NCEES
Monday, June 25, 2018, 11:30 a.m. to 1:00 p.m.
Room 150 B, Salt Palace Convention Center

Want to find out how your program and your students’ performance compare? The Fundamentals of Engineering (FE) exam can tell you.

For faculty working on assessment plans, it is important to know about the reports available from NCEES at no cost to the institution and to understand how to efficiently use the resulting data. This presentation features specific examples of using FE exam results for outcomes

M3109·SPONSOR TECHNICAL SESSION:
Using the FE Exam for Effective Outcomes Assessment
PRESENTED BY NCEES
Monday, June 25, 2018, 11:30 a.m. to 1:00 p.m.
Room 150 C, Salt Palace Convention Center

Review Procore functionality, educational offerings, and how technology is impacting the classroom. We will be focusing on common tools used by our recent graduates and how to leverage your certifications and training with future employers. We also will highlight the sample project data and classroom-ready curricula files for professors.

Procure Construction OS connects people, applications, and devices through a unified platform that helps construction firms manage risk and build quality projects safely, on time, and within budget. Headquartered in Carpinteria, Calif., with offices around the globe, Procore has more than 2.5 million users managing billions of dollars in annual construction volume.

U509·SPONSOR TECHNICAL SESSION:
Using Technology to Teach the Next Generation
PRESENTED BY PROCORE

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U4109A·SPONSOR TECHNICAL SESSION:
How to get Published in High-Impact Journals and Promote Your Research
PRESENTED BY ELSEVIER
Sunday, June 24, 2018, 1:15 p.m. to 2:45 p.m.
Room 150 B, Salt Palace Convention Center

Speakers: Daniel Christe, Innovation Adviser at Elsevier
Rahul Malik, Assistant Scientific Editor at Cell Press

Elsevier is committed to supporting researchers in advancing their publishing careers. Researchers today need to be the ultimate multitaskers as they face increasingly complex challenges. With this workshop, Elsevier/Cell Press wants to give researchers the skills and knowledge they need to publish a world class journal article, share their research data and promote their work, and ultimately succeed on their chosen career path. The program will focus on best practices and practical tools for success.

U4109B·SPONSOR TECHNICAL SESSION:
Beyond the LMS — Leveraging Modern Technology to Scale Learning and Drive Student Engagement
PRESENTED BY CAMPUSWIRE
Sunday, June 24, 2018, 1:15 p.m. to 2:45 p.m.
Room 150 A, Salt Palace Convention Center

Speakers: Tade Oyerinde, Brian Smith, and Gal Friedman

As university class sizes continue to grow and instructor/student ratios continue to decay, instructors are progressively facing new challenges in scaling their core class processes. For example, how do instructors grade hundreds of students in a manner that is effective and personal, but also efficient? And how do instructors conduct large classes while being multitaskers as they face increasingly complex challenges. With this workshop, Elsevier/Cell Press wants to give researchers the skills and knowledge they need to publish a world class journal article, share their research data and promote their work, and ultimately succeed on their chosen career path. The program will focus on best practices and practical tools for success.

Technical · Construction Engineering Division
Sunday, June 24, 2018, 3:00 p.m. to 4:30 p.m.
Room 150 B, Salt Palace Convention Center

Review Procore functionality, educational offerings, and how technology is impacting the classroom. We will be focusing on common tools used by our recent graduates and how to leverage your certifications and training with future employers. We also will highlight the sample project data and classroom-ready curricula files for professors.

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U5109·SPONSOR TECHNICAL SESSION:
Using Technology to Teach the Next Generation
PRESENTED BY PROCORE

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U5109·SPONSOR TECHNICAL SESSION:
Using Technology to Teach the Next Generation
PRESENTED BY PROCORE

Review Procore functionality, educational offerings, and how technology is impacting the classroom. We will be focusing on common tools used by our recent graduates and how to leverage your certifications and training with future employers. We also will highlight the sample project data and classroom-ready curricula files for professors.

Procure Construction OS connects people, applications, and devices through a unified platform that helps construction firms manage risk and build quality projects safely, on time, and within budget. Headquartered in Carpinteria, Calif., with offices around the globe, Procore has more than 2.5 million users managing billions of dollars in annual construction volume.

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Also joining the panel is Dave Marble, State Dam Safety Engineer project manager of the Oroville Emergency Recovery – Spillways. Department of Water Resources' State Water Project, and Dale Brown, assistant deputy director of the California Department of Water Resources. Presenters will lead a panel discussion about the incident and recovery of the Oroville Dam spillway. He will speak on the technologies used in the recovery effort.

**M5109A·SPONSOR TECHNICAL SESSION: Oroville Dam Spillway Incident and Recovery**

**PRESENTED BY UTAH STATE UNIVERSITY**

Monday, June 25, 2018, 3:15 p.m. to 4:45 p.m.

Room 150 B, Salt Palace Convention Center

Utah State University has played an important role in the spillway recovery. Dr. Johnson and a team of engineers and students at the Utah Water Research Lab designed and constructed a 1:50 scale model of the Oroville spillway to test repair and replacement solutions for the ongoing recovery effort.

**M5109B·SPONSOR TECHNICAL SESSION: Overcoming Obstacles to Project-Based Learning**

**PRESENTED BY NATIONAL INSTRUMENTS**

Monday, June 25, 2018, 3:15 p.m. to 4:45 p.m.

Room 150 A, Salt Palace Convention Center

In the next decade, engineers will be at the forefront of tackling the ever-growing societal challenges we face as a global community and the ambitious technological opportunities we’re embracing, such as autonomous electric vehicles, 5G, and renewable energy. Across each of these areas, we face urgency; innovation cannot wait. Preparing students for such challenges means ensuring that they rapidly transcend engineering theory and apply their skills to real, authentic design challenges in the classroom, in preparation for academic research and employment.

Project-Based Learning and Active Learning continue to be drivers of curricula that meets the needs of educators and students as well as industry, however there are still challenges to implementing the correct approach in the classroom. Discover four case studies of universities and their approaches to advocate change in how they teach, how students learn, and ultimately how to drive results in engagement, retention and student satisfaction.

Presenters
- Brian Hayt, Academic Product Marketing, National Instruments
- Stephanie Amrite, Americas Marketing Manager Academic and Software, National Instruments
- Bhavesh Mistry, Head of Marketing, Academic, National Instruments

**M7109B·SPONSOR TECHNICAL SESSION: A New IoT Curriculum for Freshman through Senior Courses**

**PRESENTED BY STMICROELECTRONICS**

Monday, June 25, 2018, 6:00 p.m. to 7:30 p.m.

Room 150 A, Salt Palace Convention Center

Speakers: Chris Baek, Xu Zhang, Yi Zheng, and William Kaiser, Electrical and Computer Engineering Department, University of California, Los Angeles, and Marco De Fazio and Giorgia Mariano, STMicroelectronics, Geneva, Switzerland.

The Internet of Things (IoT) vision has been harnessed to develop a motivational curriculum with the objective of accelerating learning in this transformational new field of engineering. This IoT curriculum focuses on the technology and the broad societal impact of IoT with instruction on the technology and the broad societal impact of IoT with instruction assessment in several disciplines. Attend and learn more about how the FE exam can be an effective tool for your program.
providing an affordable kit for every student, along with open source, powerful development tools. Rapid immersion in C code development is designed to accelerate learning while developing an understanding of IoT technology and the SensorTile platform. Large classes of students in their first university session and without prior computing experience have been entirely successful in hands-on project development missions. This presentation will describe the new curriculum, the SensorTile IoT platform, the Tutorial sequence, new embedded machine learning tools, and methods that have been introduced for scaling enrollment to large class size for courses supporting freshman through senior capstone design offerings.

T1109A·SPONSOR TECHNICAL SESSION: Bring robotics into your curriculum with BeagleBone® Blue
PRESENTED BY TEXAS INSTRUMENTS
Tuesday, June 26, 2018, 8:00 a.m. to 9:30 a.m.
Room 150 A, Salt Palace Convention Center

BeagleBone® Blue is a complete, Linux-enabled robotics computer. This hands-on workshop will get you up and running in 15 minutes with BeagleBone Blue’s robotics-oriented peripherals, making building mobile robots quick and affordable. Join electrical and computer engineering professor Mark Yoder and Franklin Cooper to get a first look at this platform rich with capability for mechatronics and robotics to fit your curriculum. Leave with the ability to integrate it into courses, projects, and on-campus innovation labs, complementing your LaunchPad development kits.

Presenters: Dr. Mark Yoder, Rose-Hulman Institute of Technology, and Franklin Cooper, Texas Instruments
Breakfast will be provided

T1109B·SPONSOR TECHNICAL SESSION: The Textbook Evolution – Breakfast Faculty Panel hosted by McGraw-Hill
Tuesday, June 26, 2018, 8:00 a.m. to 9:30 a.m.
Room 150 C, Salt Palace Convention Center

Join McGraw-Hill Education for an insightful panel discussion on The Textbook Evolution: Delivering a Dynamic, Active-learning Experience for Today’s Engineering Students. Engineering faculty members will discuss the evolution of the classroom experience, revealing how they deliver a rich, active-learning experience for engineering students. Many of today’s students are reluctant to purchase expensive classroom materials and have come to rely on a wide variety of sources. How do you create a diverse, dynamic learning environment that fosters optimal student outcomes? The panelists will share success stories and provide you with practical, real-world examples for integrating innovative solutions that you can take back to campus with you.

Breakfast will be served.
Moderator:
James Pitarresi, Vice Provost for Student and Faculty Development, Executive Director of the Center for Learning and Teaching, and Distinguished Teaching Professor of Mechanical Engineering, Binghamton University, State University of New York

Panelists:
Carlotta Berry, Ph.D., Associate Professor of Electrical and Computer Engineering, Rose-Hulman Institute of Technology
Mustafa Mahamid, Ph.D., S.E., P.E., F.SEI, F.ASCE, Clinical Associate Professor of Civil Engineering, University of Illinois, Chicago
Conrad Zapanta, Ph.D., Associate Department Head and Teaching Professor of Biomedical Engineering, Carnegie Mellon University

The revolution in mobile computing has been driven by the low power and integrated performance available in modern System-on-Chip (SoC) designs. As a result, understanding and practicing SoC Design is a crucial part of the curriculum in any electrical and electronic engineering or computer science department. This workshop introduces the Basic System-on-Chip (SoC) Design Education Kit from the Arm University Program and the Arm Cortex-M0 DesignStart Evaluation Kit. Using the ultra-low power Arm Cortex-M0 soft core and FPGAs as prototyping platforms, the Education Kit takes students through a typical process from creating high-level functional specifications to design, implementation, and testing on inexpensive FPGA hardware, such as the under-$50 Numato Lab Mimas V2 Spartan 6 FPGA Development Board, using standard hardware description and software programming languages.

Central to this Education Kit is a full set of teaching materials, including lecture slides, lab manuals with solutions to problems, quizzes with answers, and more, that can be readily used in a typical 10- to 14-week course. The teaching materials cover both fundamentals and practical knowledge. State-of-the-art hardware platforms are harnessed in the labs to support the course’s learning outcomes. The full Education Kit includes a complete set of teaching materials, such as lecture notes and hands-on experiments with solutions, a number of seed hardware boards donated by partners, and licenses of the Keil MDK Professional edition embedded software development tools from Arm—all available free-of-charge to professors worldwide (subject to a qualification process). Using the Numato Lab Mimas V2 Spartan 6 FPGA Development Board as the hardware platform, this session will demonstrate the use the Education Kit to implement a simple SoC design and then an SoC for energy-efficient Internet of Things applications, incorporating add-on sensor and radio modules. Faculty participants interested in following the speaker on the lab demos should have already downloaded and installed the Xilinx WebPACK ISE at: https://www.xilinx.com/products/design-tools/ise-design-suite/ise-webpack.html as well as downloaded the Arm Cortex-M0 DesignStart Evaluation Kit at https://developer.arm.com/products/designstart/university-program (now readily accessible via a click-through agreement. Furthermore, faculty participants who have already downloaded the Cortex-M0 core will receive a free Numato Lab Mimas V2 board, enabling them to be
Corporate Sponsor Sessions

hands-on during the workshop.
This workshop is presented by Arm Ltd, Cambridge, U.K., and Numato Lab, Electronics City, Bangalore India.

T4109A-SPONSOR TECHNICAL SESSION:
Engineering Licensure: Education, Examinations, and Experience
PRESENTED BY NCEES
Tuesday, June 26, 2018, 1:30 p.m. to 3:00 p.m.
Room 150 B, Salt Palace Convention Center
Speakers: David Whitman, Ph.D., P.E., University of Wyoming, retired; John Steadman, Ph.D., P.E., University of South Alabama
While each state licensing board has its own laws regarding engineering licensure, there is a general three-step process for licensure candidates: education, examinations, and experience. This presentation features a closer look at the engineering licensure process and taking the Fundamentals of Engineering (FE) exam, the first step toward becoming a licensed professional engineer (P.E.). Attend and learn more about how you and your students can join a national community of professionals committed to excellence.

T4109B-SPONSOR TECHNICAL SESSION:
- Easy teaching of embedded systems and microprocessors courses with TI MSP432 LaunchPad
PRESENTED BY TEXAS INSTRUMENTS
Tuesday, June 26, 2018, 1:30 p.m. to 3:00 p.m.
Room 150 A, Salt Palace Convention Center
Join Texas Instruments for a look at how to implement the low-cost and flexible TI LaunchPad development kits into embedded systems courses. TI and academic partners provide many resources to teach microprocessor concepts at a level appropriate for university students. Students will get hands on with industry tools while also having the flexibility to do their hardware labs on their own time and location of choice. The MSP432 provides students with a very solid, popular, and reliable ARM Cortex-M4 architecture to build their skills covering low-level concepts or more advanced system-level concepts. Presenters: Mark Easley and Jason Rubadue, Texas Instruments Snacks will be provided.

T4109C-SPONSOR TECHNICAL SESSION
PRESENTED BY THE UNIVERSITY OF MARYLAND
Tuesday, June 26, 2018, 1:30 p.m. to 3:00 p.m.
Room 150 C, Salt Palace Convention Center
This session will focus on the curriculum and teaching methods that can put engineering schools at the forefront of first-year education, and significantly decrease rates of attrition among undergraduates.

T5109B-SPONSOR TECHNICAL SESSION:
Classroom-Ready Engineering Projects with MATLAB, Simulink and IoT
PRESENTED BY MATHWORKS
Tuesday, June 26, 2018, 3:15 p.m. to 4:45 p.m.
Room 150 A, Salt Palace Convention Center
Do you want to introduce industry trends such as the Internet of Things (IoT) and deep learning as part of your curriculum? Would you like to add engaging projects to your classroom without intimidating students?

In this session, we will cover how MATLAB and Simulink can be integrated with hardware such as Arduino, Raspberry Pi, and mobile devices to solve real-world problems. We also will highlight new pre-built projects and modules that you could incorporate into your curriculum right away.

Highlights include:
- Arduino Engineering Kit: Self-balancing motorcycle, drawing robot, mobile rover
- Internet of Things: Traffic monitoring system
- Mobile devices: Step counter
- Deep learning: Automatic object recognition in webcam video feed

T5109C-SPONSOR TECHNICAL SESSION
PRESENTED BY TEXAS A&M COLLEGE OF ENGINEERING
Tuesday, June 26, 2018, 3:15 p.m. to 4:45 p.m.
Room 150 B, Salt Palace Convention Center
A panel of experts from four different institutions will discuss their best practices in terms of engineering education and what each of them are doing in order to stand out in a growing field.
Moderator: Dr. Mark Weichold, Senior Associate Dean for Academic Affairs, College of Engineering, Texas A&M University
## List of Exhibitors

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Schedule subject to change: Please go to [www.asee.org/icp](http://www.asee.org/icp) for up to date information.
Transportation

Ground Transportation

EXPRESS SHUTTLE

Shuttle Service: $9 per person each way *
Gratuity is NOT included in the above price and is optional.

*There may be an additional charge for passengers who check in after 1:00 a.m. at the airport and for passengers who depart before 4:00 a.m.

PLEASE HAVE THE FOLLOWING INFORMATION READILY AVAILABLE BEFORE BEGINNING THE BOOKING PROCESS:
• First and last name of person traveling with us
• Cell phone number
• E-mail address (so we may send a confirmation)
• Arrival and departure dates
• Arrival and departure flight information (airline, flight #)
• Lodging location

Once your reservation has been completed, a confirmation number will be assigned and e-mailed to you. Please keep this number handy for any changes that may need to be made.

SCHEDULING A RESERVATION ONLINE:
• Go to our website: www.ExpressShuttleUtah.com
• Select: Make a Reservation.
• Select: Group Code (left side bar)
• Type in code: conferenceslc (case sensitive) then continue to book your reservation!

SCHEDULING A RESERVATION WITH A REPRESENTATIVE:
• Call 801-596-1600
• Choose option 1. Please make reservations at least 24 hours in advance.
• Passengers must tell the reservationist they are with the ASEE Convention 2018 and use the Group # 45823 in order to receive the discounted rate.

ARRIVAL INSTRUCTIONS: Upon arriving at the Salt Lake City International Airport, proceed to the Express Shuttle desk, located inside the terminal next to the baggage claim. In Terminal #1, we are located across from baggage claim #2; in Terminal #2 we are across from baggage claim #6. Check in with the representative. Shared shuttle service wait time is 20 minutes after you have secured your luggage.

DEPARTURE INSTRUCTIONS: Plan to depart for the airport at least 1.5 to 2 hours prior to your flight. The shared shuttle departs the Grand America Hotel at the top and bottom of the hour, with a 15-minute window for the driver.

CANCELLATION POLICY: Cancellations must be made 24 hours in advance of scheduled pick-up. Cancellations received within 24 hours are non-refundable.

US Bus Utah is Salt Lake City’s exclusive hop on, hop off sightseeing tour company. We invite you to join us for either a hop on, hop off tour during the day, when your pass is valid for 24 hours from the time of boarding, or for an evening group with at least 10 participants. Our complete tour covers a 19-mile loop of Salt Lake City and lasts 90 minutes. You can view a map and schedule and purchase tickets online at http://usbusutah.com or visit our booth outside the Salt Palace convention center seven days a week from 9:15 a.m. to 3:30 p.m.

We hope you enjoy your stay and look forward to having you for a tour. If you are interested in scheduling a group tour with 10 or more people at a discounted rate of $25 per person, you can call AnnaLaura at 801-712-1050.

Ride Sharing Services
The easiest and quickest way to get around Salt Lake City is Uber. Uber also launched UberWAV in Salt Lake City, which allows riders with relevant disabilities to request wheelchair-accessible vehicles

https://www.uber.com/
https://www.uber.com/drive/salt-lake-city/resources/uber-wav/

Local Taxis

* Ute Cab Company
http://utecabco.com/home/4150306
801-359-7788

Wednesday, June 28, 2017 . . . . . . . . . . . . . 8:00 a.m. to noon
On-site Services

Electronic Devices
ASEE requests that cell phones, pagers, etc., be turned off during all sessions. If it is necessary to use your cell phone, please step outside the meeting room to an area where you will not disturb the other attendees.

Local Information Desk
A local information desk will be located in the ASEE registration area of the Salt Palace Convention Center. Please stop by to receive suggestions on local restaurants, sightseeing, and transportation.

Scooters
ASEE will provide scooters for attendee’s daily use during conference. If you would like to use a scooter please stop by the information desk to pick up a voucher for the daily rental. Scooters are limited in number and thus on a first-come, first-served basis. If you would like to rent a scooter for the week, you may do so at the business center: https://ww04.elbowspace.com/secure/2015111713250952593Childcare

ASEE will offer complimentary childcare services for children ages 3 months -14 years old at the 2018 Annual Conference & Exposition through Guardian Angel Babysitting https://www.guardianangelbaby.com/.

The childcare area will be in the front of the Exhibit Hall at the Salt Palace Convention Center and available at the following times:

- Sunday: 8:00 a.m. to 5:00 p.m.
- Monday: 8:00 a.m. to 5:00 p.m.
- Tuesday: 8:00 a.m. to 5:00 p.m.
- Wednesday: 8:00 a.m. to Noon

For scheduling purposes, all childcare needs must be submitted no later than May 25, 2018

Please submit your completed waiver to Crystal Christian: headangel@guardianangelbaby.com. Questions? Please call (509) 379-7976 or e-mail headangel@guardianangelbaby.com

Gender Neutral Restrooms
Three restrooms in the Salt Palace Convention Center have been designated as gender neutral/family/handicapped restrooms. Two are on the main level and one is next to Room 255 on the north end.

Mother’s Room
A room will be located on the Exhibit Hall floor behind the ASEE staff offices and open during registration hours. See ASEE staff at the info kiosk for access during non-exhibit hall hours.

Tuesday: 8:00 a.m. - 5:00 p.m.
Wednesday: 8:00 a.m. - 3:00 p.m.

Closed Captioning
Closed captioning will be available at the Monday and Tuesday Plenary.
Instructions to access this service will be provided on site.

ASEE Registration Area
Salt Palace Convention Center,
Exhibit Hall A, B, and C

Saturday, June 23, 2018, 4:00 p.m. to 7:00 p.m.
Sunday, June 24, 2018, 7:00 a.m. to 7:00 p.m.
Monday, June 25, 2018, 7:00 a.m. to 5:00 p.m.
Tuesday, June 26, 2018, 8:00 a.m. to 5:00 p.m.
Wednesday, June 27, 2018, 8:00 a.m. to 3:00 p.m.

Ticket Sales
To order tickets for workshops, meal functions, and special events, please visit the ASEE registration desk in the Salt Palace Convention Center, Exhibit Hall A, B, and C. Tickets will be sold on a first-come, first-served basis. Please note that on-site ticket sales close the day before the event takes place. Be sure to register early, as space is limited. Tickets purchased on-site will be assessed a $10 on-site charge.

Wi-Fi
The following Wi-Fi options are available at the Salt Palace Convention Center:

- SP Guest (2MB): Complimentary wireless Internet access, available in one hour sessions, is available ONLY in meeting rooms and lobby areas.
- SP Guest Daily (3MB): Option to upgrade the guest access to be daily for $15 per day, available ONLY in meeting rooms and lobby areas.
- SP Premium (20MB): High-speed wireless Internet access at a rate of $60 per device per day is available facility-wide.

To log into the Wi-Fi, open a browser and you should be directed to the portal where you can set up your account and purchase service.

Important: Take note of your username and password displayed just before you login. You will need this information to get back online if you get disconnected. Your account can only be used on the device for which it was purchased.
## Hotel Information

<table>
<thead>
<tr>
<th>Hotel Information</th>
<th>Phone Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salt Lake Marriott Downtown at City Creek - Headquarters</td>
<td>75 South West Temple (801) 431-0800</td>
</tr>
<tr>
<td>Courtyard by Marriott Downtown</td>
<td>345 West 100 South (385) 290-6500</td>
</tr>
<tr>
<td>Fairfield Inn &amp; Suites Salt Lake City Downtown</td>
<td>130 West 400 South (801) 531-6000</td>
</tr>
<tr>
<td>Hilton Salt Lake City Center</td>
<td>255 South West Temple (801) 238-4888</td>
</tr>
<tr>
<td>Holiday Inn Express Salt Lake City Downtown</td>
<td>206 South West Temple (801) 521-9500</td>
</tr>
<tr>
<td>Homewood Suites by Hilton, Downtown</td>
<td>423 West 300 South, 801-363-6700</td>
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## Hotel Information

<table>
<thead>
<tr>
<th>Hotel Information</th>
<th>Phone Numbers</th>
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</thead>
<tbody>
<tr>
<td>Hotel Monaco</td>
<td>15 West 200 South (801) 595-0000</td>
</tr>
<tr>
<td>Hyatt House Salt Lake City Downtown</td>
<td>140 South 300 West (801) 359-4020</td>
</tr>
<tr>
<td>Radisson Hotel Salt Lake City Downtown</td>
<td>215 West South Temple (801) 531-7500</td>
</tr>
<tr>
<td>Salt Lake Plaza Hotel at Temple Square</td>
<td>122 West South Temple 801-521-0130</td>
</tr>
<tr>
<td>Sheraton Salt Lake City Hotel</td>
<td>150 West 500 South (801) 401-2000</td>
</tr>
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</table>

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Schedule subject to change: Please go to [www.asee.org/icp](http://www.asee.org/icp) for up to date information
American Society for Engineering Education
June 24 - 28, 2018

- Salt Lake Plaza Hotel at Temple Square
- Redisson Hotel Salt Lake City Downtown
- Salt Lake Marriott Downtown at City Creek
- Holiday Inn Express Salt Lake City Downtown
- Hotel Monaco
- Hilton Salt Lake City Center
- Sheraton Salt Lake City Hotel
- Double Tree Suites by Hilton Salt Lake City
- Hotel RL Salt Lake City

Map of Columbus Housing Locations

Schedule subject to change: Please go to www.asee.org/icp for up to date information
FLOOR PLANS

Calvin L. Rampton
Salt Palace Convention Center

Salt Palace Facts:

1. 515,000 gross square feet of contiguous exhibit hall space, divisible into 9 halls.
2. With over 160,000 square feet of meeting space, we can host 67 concurrent meetings.
3. Received Silver level LEED certification.
4. An award-winning exclusive caterer, Utah Food Services, is located onsite.
5. PSAV is the in-house preferred AV provider, capable of providing all AV and production services.
6. 2GB high-speed internet access is available over the in-house fiber optic network.
7. Wireless system capable of over 10,000 concurrent devices.
8. Has no labor agreements with any union entities.
9. 1,000 underground parking stalls and 40 loading docks.
10. Solar panel installation on the Salt Palace rooftop provides 1.50 megawatts of solar power.
Registration Information and Fees

Registration Hours
Saturday, June 23 ............. 4:00 p.m. to 7:00 p.m.
Sunday, June 24 .............. 7:00 a.m. to 6:00 p.m.
Monday, June 25 .............. 7:00 a.m. to 5:00 p.m.
Tuesday, June 26 ............. 8:00 a.m. to 5:00 p.m.
Wednesday, June 27 ......... 8:00 a.m. to 3:00 p.m.

On-Site Registration
On-site registration will be located inside the Exhibit Hall A, B, and C of the Salt Palace Convention Center. Attendees of Sunday workshops should check in early Sunday morning or Saturday evening.

Registration Fees

<table>
<thead>
<tr>
<th>Rate Type</th>
<th>2017 On-Site Fees</th>
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<tr>
<td>Member</td>
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<tr>
<td>Non Member</td>
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<tr>
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<tr>
<td>Student Member</td>
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<tr>
<td>Student Non Member</td>
<td>US $60</td>
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<tr>
<td>Industry Day**</td>
<td>US $290</td>
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<tr>
<td>Child (7 - 16)*</td>
<td>US $35</td>
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<tr>
<td>Child (under 6)*</td>
<td>Free</td>
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*Children
Children under 12 are admitted FREE to the exhibit hall. Please note that children under 12 must be accompanied by a registered adult at all times.

**Industry Day
The Industry Day rate is only available to members of industry who otherwise would not attend the ASEE Annual Conference and is valid for only Tuesday, June 26, 2018. ASEE members and co-authors are not eligible.

Registration fees include:

<table>
<thead>
<tr>
<th></th>
<th>Taste of Salt Lake</th>
<th>Division Mixer</th>
<th>Exposition &amp; Focus on Exhibits Events</th>
<th>Plenaries</th>
<th>Technical Sessions</th>
<th>President’s Farewell Reception</th>
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<td>Member/Non-Member Full Registration</td>
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<td>Life Member</td>
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<tr>
<td>Child (ages 6 to 16)</td>
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<tr>
<td>Industry Day</td>
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<tr>
<td>Retiree Member</td>
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</tbody>
</table>

Registration Conditions
Purchase order payments must have been received by Sunday, June 3, 2018 or your registration would have been cancelled and you will need to register on site at the applicable rate.

To be eligible, the student must:
1. Be currently enrolled in a college or university
2. Be registered on a full conference registrant’s form

NOTE: Only one student per full-conference registrant is allowed.

Bring-a-Student Program
Each full conference registrant has the opportunity to bring one student to the conference at no additional charge. This complimentary student registration includes admission to the technical sessions, exposition, and reception on Wednesday evening; allows students to register for all events; and provides the conference bag, program, and proceedings.

Spouse/Guest/Children Rate
Spouses, guests, and children must be registered for the conference to participate in the conference sessions, workshops, or exhibit hall activities. Another faculty member or peer is not considered a spouse or guest and must be registered as a full participant. Please see the chart for registration rates and what’s included.
Registration Information and Fees

A la Carte Tickets
Tickets to all ASEE events are available à la carte. Please refer to the program details for availability and pricing.

K-12 Teachers
$250 for a one day registration. K-12 teachers also are eligible for a one day FREE Exhibit Hall Pass. School ID is required.

Military
Active and retired military are eligible for a one day FREE Exhibit Hall Pass. Military ID is required.

ASEE Membership
Please be advised that the non-member professional rate does NOT include a one-year ASEE membership.

ASEE membership rates are as follows:
1. US $100 for United States residents
2. US $99 for Canadian residents
3. US $114 for residents of all other countries
4. $89 for online membership only

Cancellation Policy
Registration and ticket cancellations must be made in writing and must be received by ASEE-Convention & Seminar Corp. via mail (1818 N Street NW, Suite 600, Washington, DC 20036); Phone: (202) 649-3829; Fax: (202) 265-8504; or E-mail: registrar@asee.org on or before Sunday, June 3, 2018. A $50 processing fee will apply to all cancellations. On-site refunds of any ticketed events cannot be honored. There are no exceptions to this policy.

ASEE Membership
Please be advised that those who register at the non-member professional rate will receive one year of ASEE membership. Not available for student rate.

ASEE membership rates are as follows:
1. US $100 for United States residents
2. $99 for Canadian residents
3. US $114 for residents of all other countries
4. US $84 for online membership only

Cancellation Policy
Registration and ticket cancellations must have been made in writing and received by ASEE-Convention & Seminar Corp. via mail (1818 N Street NW, Suite 600, Washington, DC 20036); Phone: (202) 649-3829; Fax: (202) 265-8504; Email: registrar@asee.org on or before Sunday, June 4, 2017. A $50 processing fee will apply to all cancellations. There are no refunds for no-shows and on-site refunds of any ticketed events cannot be honored. There are no exceptions to this policy.
2018 ASEE Program Chairs

ASEE would like to acknowledge and thank the 2017 ASEE Program and Division Chairs for all their hard work and dedication.

<table>
<thead>
<tr>
<th>name</th>
<th>Guide code</th>
<th>Program chair name</th>
<th>Program chair organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABET Sponsored Sessions</td>
<td>116</td>
<td>Ashok K. Agrawal</td>
<td>American Society for Engineering Education</td>
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<tr>
<td>Academy of Fellows</td>
<td>92</td>
<td>Patti Greenawalt</td>
<td>American Society for Engineering Education</td>
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<tr>
<td>Aerospace Division</td>
<td>1</td>
<td>Sharan Asundi</td>
<td>Tuskegee University</td>
</tr>
<tr>
<td>Architectural Engineering Division</td>
<td>2</td>
<td>Sudarshan Krishnan</td>
<td>University of Illinois, Urbana-Champaign</td>
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<tr>
<td>ASEE Board of Directors</td>
<td>93</td>
<td>Patti Greenawalt</td>
<td>American Society for Engineering Education</td>
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<tr>
<td>ASEE Diversity Committee</td>
<td>112</td>
<td>Susan E. Walden</td>
<td>University of Oklahoma</td>
</tr>
<tr>
<td>ASEE Global Programs</td>
<td>94</td>
<td>Tonya B. Tucker</td>
<td>American Society for Engineering Education</td>
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<tr>
<td>ASEE Headquarters</td>
<td>96</td>
<td>Patti Greenawalt</td>
<td>American Society for Engineering Education</td>
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<td>ASEE Staff</td>
<td>97</td>
<td>Patti Greenawalt</td>
<td>American Society for Engineering Education</td>
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<td>Awards Policy Committee</td>
<td>98</td>
<td>Patti Greenawalt</td>
<td>American Society for Engineering Education</td>
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<tr>
<td>Biological and Agricultural</td>
<td>3</td>
<td>Joel Peterson</td>
<td>University of Wisconsin, River Falls</td>
</tr>
<tr>
<td>Engineering Division</td>
<td></td>
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<tr>
<td>Biomedical Engineering Division</td>
<td>4</td>
<td>Richard Goldberg</td>
<td>University of North Carolina, Chapel Hill</td>
</tr>
<tr>
<td>Campus Representatives</td>
<td>99</td>
<td>Tim Manicom</td>
<td></td>
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<tr>
<td>Chemical Engineering Division</td>
<td>5</td>
<td>Daniel D. Anastasio</td>
<td>Rose-Hulman Institute of Technology</td>
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<tr>
<td>Civil Engineering Division</td>
<td>6</td>
<td>Andrea L. Welker</td>
<td>Villanova University</td>
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<tr>
<td>College Industry Partnerships</td>
<td>7</td>
<td>Charles E. Baukal</td>
<td>John Zink Co. LLC</td>
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<tr>
<td>Division</td>
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<tr>
<td>Community Engagement Division</td>
<td>52</td>
<td>James L. Huff</td>
<td>Harding University</td>
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<tr>
<td>Computers in Education Division</td>
<td>8</td>
<td>Walter W Schilling</td>
<td>Milwaukee School of Engineering</td>
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<tr>
<td>Computing and Information Technology Division</td>
<td>30</td>
<td>Mudasser Fraz Wyne</td>
<td>National University</td>
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<tr>
<td>Construction Engineering Division</td>
<td>9</td>
<td>Norman Philipp</td>
<td>Pittsburg State University</td>
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<tr>
<td>Continuing Professional Development</td>
<td>10</td>
<td>Douglas Ernie</td>
<td>University of Minnesota, Twin Cities</td>
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<tr>
<td>Cooperative and Experiential</td>
<td>11</td>
<td>Lisa Massi</td>
<td>University of Central Florida</td>
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<tr>
<td>Corporate Member Council</td>
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<td>Alice F. Squires</td>
<td>International Council on Systems Engineering</td>
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<tr>
<td>Council of Sections</td>
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<td>American Society for Engineering Education</td>
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<tr>
<td>Design in Engineering Education</td>
<td>13</td>
<td>Jessica A Kuczenski</td>
<td>Santa Clara University</td>
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<td>Eco-Car Poster Session</td>
<td>111</td>
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<tr>
<td>Educational Research and Methods</td>
<td>14</td>
<td>Deborah M. Grzybowski</td>
<td>Ohio State University</td>
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<td>Electrical and Computer Division</td>
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<td>Steve E. Watkins</td>
<td>Missouri University of Science &amp; Technology</td>
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<tr>
<td>Energy Conversion and Conservation Division</td>
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<td>S. Hossein Mousavinezhad</td>
<td>Idaho State University</td>
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<td>Daniel B Oerther</td>
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<td>Olha Samoilenko</td>
<td>American Society for Engineering Education</td>
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<td>Heidi M Steinhauer</td>
<td>Embry-Riddle Aeronautical Univ., Daytona Beach</td>
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<tr>
<td>Engineering Economy Division</td>
<td>19</td>
<td>Billy Gray</td>
<td>Tarleton State University</td>
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<tr>
<td>Engineering Ethics Division</td>
<td>20</td>
<td>Andrew O. Brightman</td>
<td>Purdue University-Main Campus, West Lafayette (College of Engineering)</td>
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<tr>
<td>Engineering Leadership Development Division</td>
<td>55</td>
<td>Gregg Morris Warnick</td>
<td>Brigham Young University</td>
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<tr>
<td>Engineering Libraries Division</td>
<td>21</td>
<td>William M Baer</td>
<td>University of Notre Dame</td>
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<td>Engineering Management Division</td>
<td>22</td>
<td>Elizabeth A Cudney</td>
<td>Missouri University of Science &amp; Technology</td>
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<tr>
<td>Engineering Physics and Physics Division</td>
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<td>Robert A Ross</td>
<td>University of Detroit Mercy</td>
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<td>Pamela Marie Norris</td>
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<td>Marilyn A. Dyrud</td>
<td>Oregon Institute of Technology</td>
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<td>Enrique Barbieri</td>
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<td>Thomas P. James</td>
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<td>Monica Palomo</td>
<td>California State Polytechnic University, Pomona</td>
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<tr>
<td>Experimentation and Laboratory-Oriented Studies Division</td>
<td>26</td>
<td>Ernest M. Kim</td>
<td>University of San Diego</td>
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<td>Faculty Development Constituency Committee Division</td>
<td>80</td>
<td>Stephanie Cutler</td>
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<td>First-Year Programs Division</td>
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<td>Kerry Meyers</td>
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<td>Graduate Studies Division</td>
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<td>Kathleen Colbry</td>
<td>Michigan State University</td>
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<tr>
<td>Industrial Engineering Division</td>
<td>29</td>
<td>Justin W. Kile</td>
<td>Quinnipiac University</td>
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<td>Instrumentation Division</td>
<td>31</td>
<td>Masoud Fathizadeh</td>
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<td>Phillip Albert Sanger</td>
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<tr>
<td>Liberal Education/Engineering &amp; Society Division</td>
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<td>Kathryn A. Neeley</td>
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<tr>
<td>Manufacturing Division</td>
<td>35</td>
<td>Yalcin Ertekin</td>
<td>Drexel University (Tech.) (MERGED)</td>
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<tr>
<td>Materials Division</td>
<td>36</td>
<td>Alison K Polasik</td>
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## 2018 ASEE Program Chairs

<table>
<thead>
<tr>
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<th>Guide code</th>
<th>Program chair name</th>
<th>Program chair organization</th>
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<tbody>
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<td>William Fitzgibbon</td>
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<td>Radu F. Babiceanu Embry-Riddle Aeronautical</td>
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<td>Univ., Daytona Beach</td>
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<td>Mechanical Engineering Division</td>
<td>38</td>
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<td>Mechanics Division</td>
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Texas A&M University's 25 by 25 initiative is transforming the educational experience for our students. Hands-on active learning; opportunities for leadership, global experiences and entrepreneurship; discovering a passion and establishing an “X” factor, a strength to set a student apart from their peers, are just some of the ways Texas A&M is developing the engineers of the future.
Hundreds of engineering educators successfully use NCEES Subject Matter Reports during the accreditation process to

- Measure student outcomes
- Demonstrate program improvements

Reports contain summary results by subject area for all ABET-accredited engineering degree programs.

Access your NCEES Subject Matter Reports at institutions.ncees.org.
More than 400 technical sessions have been developed by some 60 Divisions/Units of ASEE, including over 50 concurrent technical sessions in each time period across three days.

Overview

Technical Program includes:
- Award-winning presentations
- Comprehensive workshops
- Panel discussions
- Interactive poster and multimedia sessions
- Division business meetings and social activities

Session topics include:
- ABET
- Assessments
- Communications
- Curriculum
- Distance education
- Diversity
- Educational methods
- Industrial partnerships
- PreK-12
- Professional development
- Retention
- Web technology

Deans and faculty members, industry and government representatives, and leaders in education will give presentations. ASEE division peer-reviewed papers will be published on a searchable flash drive.

Conference Evaluation Forms
Are available online and will be e-mailed to you at the conclusion of the conference. We rely on your feedback to continue to improve our offerings, so please take a moment to complete the evaluation form when you are able.

Conference Proceedings
A flash drive is available for all fully registered attendees for $5. Proceedings are not provided for spouse, guest, or child registrants.

Matrix
An easy-to-read matrix of all conference events and sessions will be posted near the ASEE Registration area in the Salt Palace Convention Center.

Session Seating
Every effort is made to assign meeting space based on estimated attendance provided by the program chairs. All seating will be provided on a first-come, first-served basis.
**Conference Sessions**

**Session Code Guide:**

The following is a guide to understanding the codes identifying technical sessions, workshops, and ticketed events listed in this program. Sessions are listed according to the day they are scheduled and in numerical order based on session number. In most cases, session numbers represent the following:

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Last Digits: These digits represent numbers assigned to sponsoring divisions or committees.

For example: Session W314 = Wednesday, 11:30 a.m. - 1:00 p.m., Educational Research and Methods

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Schedule subject to change: Please go to [www.asee.org/icp](http://www.asee.org/icp) for up to date information.
U96 - ASEE Bistro Sponsored by Weber State University
6:00 a.m. - 10:00 p.m., Exhibit Hall A B & C, Convention Center - Salt Palace
Sponsor: ASEE Headquarters

U196B - ASEE Registration Open
7:00 a.m. - 7:00 p.m., Exhibit Hall A B & C, Convention Center - Salt Palace
Sponsor: ASEE Headquarters

U296 - Sunrise Gentle Yoga
7:00 a.m. - 7:45 a.m., South Foyer, Convention Center - Salt Palace
Sponsor: ASEE Headquarters
Join your friends and colleagues as we jump-start our day with a renewing stretch and meditation class! (Mats and exercise clothes are not required.)

U93A - ASEE Finance Committee Meeting
8:00 a.m. - 9:25 a.m., Salon E, HQ Hotel - Marriott at City Creek
Sponsor: ASEE Board of Directors

U113 - UEC Associate Deans Meeting
12:00 p.m. - 4:00 p.m., Salon I, HQ Hotel - Marriott at City Creek
Sponsor: Undergraduate Experience Committee
UEC Associate Deans Meeting and Lunch
Tickets: $45.00 advanced registration and $55.00 on site registration

U196A - ASEE’s Living Wall
7:00 a.m. - 7:00 p.m., Exhibit Hall Foyer, Convention Center - Salt Palace
Sponsor: ASEE Headquarters
We’re excited to bring back the ASEE Living Wall to the Annual Conference this year! Each year at the conference, attendees will contribute their thoughts to the Wall by writing a response to a particular question or idea. The Wall will be preserved and displayed from year to year, growing bigger and bigger, and serving as a historical document of our conference attendees’ insights, ruminations, and reflections. We hope you’ll take a few moments to leave your legacy on the Wall, located near the Exhibit Hall.

U206 - SUNDAY WORKSHOP: Applications of the Envision Rating System in Engineering Courses and Curricula
9:00 a.m. - 12:00 p.m., Room 150 F, Convention Center - Salt Palace
Sponsor: Civil Engineering Division
Speakers: Dr. Cliff I. Davidson, Syracuse University; Dr. Malay Ghose Hajra P.E., University of New Orleans; Dr. Yvette E. Pearson P.E., Rice University
Envision is a rating system administered by the Institute for Sustainable Infrastructure (ISI) that provides a holistic framework for evaluating and rating the community, environmental, and economic life cycle impacts and benefits of all types and sizes of infrastructure projects. This framework is an exceptional resource for incorporating sustainability into engineering design projects. This workshop, created in conjunction with the Formal Engineering Education Committee of ASCE, will provide concrete examples of how Envision can be used as a teaching tool throughout civil and environmental curricula, with implications and suggestions for use in other engineering disciplines. Methods of introducing the broad topic of sustainable engineering early in the curriculum will be included.
Tickets: $10.00 advanced registration and $20.00 on site registration

U2109A - SUNDAY WORKSHOP: Teaching Prototyping – Translating Best Practices from Industry to Design Courses
9:00 a.m. - 12:00 p.m., Room 150 D, Convention Center - Salt Palace
Sponsor: Sponsored Sessions
Speakers: Miss Carlye Lauff, University of Colorado, Boulder; Dr. Daria A Kotys-Schwartz, University of Colorado, Boulder; Ms. Jessica Dolores Menold, Pennsylvania State University, University Park
Prototyping is one of the most important elements of the design majority of the engineering curriculum focuses on development of sustaining technologies (e.g., improving performance or adding new features to products, whether or not the customer wants them). In contrast, disruptive technologies target low-end customers through products/services that are simpler, more convenient, and often less expensive than competitors’. These technologies are also extremely customer-focused, thus providing ideal training for students to develop EML skills, such as connecting with customers and creating value. In this workshop, attendees will be exposed to the basic concepts of disruptive technologies, including a hands-on activity in which they explore disruptive innovation. Attendees will also develop ideas for engaging students with disruptive technologies in their own courses, with the goal of walking away with two or three ideas they can implement immediately.
Tickets: $25.00 advanced registration and $35.00 on site registration

Schedule subject to change: Please go to www.asee.org/icp for up to date information
One way these skills are developed in active learning environments is through student-student interactions as they work collectively on tasks. Monitoring these interactions provides feedback to the students on the quality of the observed skill and insights for the instructor on the overall effectiveness of the learning environment. These skills may also be developed and assessed in written assignments. Evaluating student written work allows an instructor to give feedback to individual students as well as reflect on the quality of the given assignments in eliciting evidence of professional skills. Intentional assessment of professional skills and subsequent feedback provides a means to explicitly incorporate these skills into regular classroom practice and better align the enacted curriculum with the intended learning outcomes.

**Ticketed event: $20.00 advanced registration and $30.00 on site registration**

**U2109C - SUNDAY WORKSHOP: ELIPSS Project Workshop – Enhancing Learning by Assessing Professional Skills in Student Group Interactions and Written Work**

*9:00 a.m. - 12:00 p.m., Room 155 A, Convention Center - Salt Palace*

**Sponsor: Sponsored Sessions**

**Speaker: Prof. Renee Cole, University of Iowa**

Students’ professional skills, such as teamwork, communication, and critical thinking, can be enhanced when assessment and feedback on the development of these skills are provided. One way these skills are developed in active learning environments is through student-student interactions as they work collectively on tasks. Monitoring these interactions provides feedback to the students on the quality of the observed skill and insights for the instructor on the overall effectiveness of the learning environment. These skills may also be developed and assessed in written assignments. Evaluating student written work allows an instructor to give feedback to individual students as well as reflect on the quality of the given assignments in eliciting evidence of professional skills. Intentional assessment of professional skills and subsequent feedback provides a means to explicitly incorporate these skills into regular classroom practice and better align the enacted curriculum with the intended learning outcomes.

**Ticketed event: $20.00 advanced registration and $30.00 on site registration**
Conference Sessions

U2109D - SUNDAY WORKSHOP: Hands-on Workshop: Discovering Opportunities to Use a Learning Analytics Solution for Supporting Quality Assurance in Your Own Institution
9:00 a.m. - 12:00 p.m., Room 253 A, Convention Center - Salt Palace

Sponsor: Sponsored Sessions
Speakers: Miss Isabel Hilliger P.E., Pontificia Universidad Catolica de Chile; Dr. Constanza Miranda Mendoza, Pontificia Universidad Catolica de Chile

Description
The workshop consists of three modules:
1. A case-based approach on our institutional experience adopting a learning analytics tool. Apart from having a conducted discussion, we want to talk about the gains and losses in doing so. Not everything is perfect.
2. Participants will have the chance to use a demo in order to identify opportunities of using this type of tool in their institution.
3. Participants will be guided through a card-sorting activity to evaluate the design and to provide feedback in order to improve the tool from a UX point of view – Does it work for me? How would I use it? My dream platform would be…

At the end of the workshop, participants will be able to:
1. Recognize an opportunity to adopt a learning analytics solution for quality assurance,
2. Test and evaluate an existing learning analytics solution for supporting curriculum improvement,
3. Reflect on the need of a learning analytics solution for supporting quality assurance within their institutions.

Free ticketed event

U2109E - SUNDAY WORKSHOP: Infusing Creativity and Conation into Engineering Education
9:00 a.m. - 12:00 p.m., Room 155 E, Convention Center - Salt Palace

Sponsor: Sponsored Sessions
Speakers: Dr. Karen A High, Clemson University; Dr. Claire L. A. Dancz, Clemson University

This workshop will be divided into three parts: Conation, Creativity, and Connection. Part 1 - Conation: Dr. Claire Dancz, Kolbe™-certified consultant, will guide participants in validated Kolbe ATM Index results and how to operationalize conative diversity when working with colleagues and students. Part 2 - Creativity: Dr. Karen High will lead participants in active exploration of research and implementation of creativity in engineering courses and curricula. High and Dancz will share successful strategies and lessons learned from their reimagineered course entitled “Conation and Creativity in Engineering.” Participants will develop a curriculum plan for “re-imagineering” a course or activity at their own institution. Part 3 - Connection: participants will share their revisions and receive an invitation to continue conversations and form an online community. Participants will be asked to complete a Kolbe ATM Index prior to the workshop.

Free ticketed event

U2109F - SUNDAY WORKSHOP: Integrating Monte Carlo Simulation into Undergraduate Engineering Courses
9:00 a.m. - 12:00 p.m., Room 151 G, Convention Center - Salt Palace

Sponsor: Sponsored Sessions
Speakers: Dr. James Burns, Purdue Polytechnic Institute; Dr. Bob E. White P.E., Western Michigan University; Dr. Azim Houshyar, Western Michigan University

Monte Carlo Simulation is a powerful technique for modeling the behavior of complex systems ranging from microelectronics to financial markets, yet can be remarkably simple to incorporate into undergraduate engineering courses. This workshop teaches participants how to use readily-available Monte Carlo Simulation software in the classroom through hands-on tutorials. This workshop is designed for instructors from any engineering discipline who teach undergraduate courses where a systems- or design-thinking approach is useful. Cross-disciplinary courses such as Engineering Economy, gateway engineering design courses, and applied mathematics courses are particularly well-suited for integrating Monte Carlo Simulation. The techniques and simulation projects covered in this workshop have been applied successfully in undergraduate courses. This workshop is designed to give participants the knowledge and confidence to integrate Monte Carlo Simulation techniques into existing assignments and to develop new assignments that add depth and richness to a course’s content. Workshop topics and activities are:

- Introduction to Monte Carlo Simulation and its applications.
- Brief review of probability & statistics concepts that are essential to Monte Carlo Simulation.
- Building simple probability models using Microsoft Excel and Oracle Crystal Ball.
- Completing one or more advanced tutorials that cover constructing simulation models, running a simulation, analyzing results, and performing optimization. Tutorial topics to choose from include:
  - A financial analysis for planning your retirement.
  - Design and analysis of an electrical circuit.
  - Design of an electrical transmission line.
  - Analyzing a quality control problem for a manufacturing operation.
  - Discuss best practices for designing, implementing, and assessing assignments.
  - Learn about some of the advanced features of the software, plus helpful modeling tips and workarounds for some of the common problems that arise when first beginning to use Monte Carlo Simulation.

This workshop is designed to give participants the knowledge and confidence to integrate Monte Carlo Simulation techniques into existing assignments and to develop new assignments that add depth and richness to a course’s content. Workshop topics and activities are:

Free ticketed event
U2109G - SUNDAY WORKSHOP: Remote Laboratories for Engineering Education
9:00 a.m. - 12:00 p.m., Room 355 D, Convention Center - Salt Palace
Sponsor: Sponsored Sessions
Speakers: Prof. Abul K. M. Azad, Northern Illinois University; Prof. Michael E. Auer, IAOE; Mr. Alfred Breznik, Emona Instruments Pty. Ltd.; Dr. Dominik May, University of Georgia; Kalyan Ram B, CEO, Electrono Solutions

Advancement in computer and Internet technologies has allowed tremendous growth of networks and with it, introduction of the Internet Of Things (IoT). Engineering educators and researchers have used this protocol to connect their experimental systems with the web, thus creating Internet-accessible remote laboratories. Given that this is a specialized development, there is as yet no formal/informal training in terms of design and development of these remote laboratories, nor for their implementation in course offerings and associated management. This workshop will provide an opportunity for academics, researchers, and developers to gain hands-on experience in using remote laboratories. The workshop will facilitate the use of two or three successful remote laboratory systems and the associated pedagogy. At the end, there will be a discussion in which attendees can learn from experts about incorporating remote laboratories in their own laboratory courses.

Free ticketed event

U2109H - SUNDAY WORKSHOP: MIPSfpga: Hands-on Learning Using an Unobfuscated Commercial MIPS Core
9:00 a.m. - 12:00 p.m., Room 355 A, Convention Center - Salt Palace
Sponsor: Sponsored Sessions
Speakers: Prof. Sarah L Harris; Daniel Chaver Martinez, University Complutense of Madrid

This MIPSfpga workshop shows how to access and use the MIPSfpga package, which includes the Verilog source code of the commercial MIPS microAptiv processor, all required development tools for MIPSfpga, a comprehensive Getting Started Guide that describes, among other things, the MIPSfpga system and how to simulate and run MIPSfpga on different FPGAs, and 25 hands-on labs. These labs guide users in writing, debugging, and running programs on the MIPSfpga core; extending the core to interface with I/O (i.e., audio, sensors, LCDs); using interrupts and performance counters; exploring and modifying the pipeline and hazard logic; adding new instructions manually and using CorExtend; and exploring and modifying the memory system, including the caches.

The workshop shows how to use MIPSfpga to easily transition from theory to practice when teaching computer architecture, system-on-chip, and digital design principles. Attendees will learn about the MIPSfpga system, see an overview of all of the labs, and experiment with a subset of the labs on their own laptops. By the end of the workshop, attendees will have the tools, resources, and experience to use MIPSfpga to increase hands-on learning and understanding of computer architecture, system-on-chip design, hardware-software co-design, embedded systems, and memory system design.

U2109I - SUNDAY WORKSHOP: Is the Engineering Education Revolution Bypassing Civil Engineering? Workshopping a Civil-Specific Response
9:00 a.m. - 12:00 p.m., Room 255 D, Convention Center - Salt Palace
Sponsor: Sponsored Sessions
Speaker: Mark W. Milke P.E., University of Canterbury
“The Coming Revolution in Engineering Education,” as described by Goldberg and Somerville, is being realized at Olin College (U.S.A.), NMITE (U.K.), and in lesser forms in many other places. A closer look at the description of the goals and curricula involved indicate great difficulty in using these programs to develop future civil engineers.

• The curricular emphasis on design, creativity, entrepreneurial thinking, and innovation (which sounds transferable to civil engineers) hides the fact that the fundamentals taught are those used by software, electrical, and mechanical engineers.

• The focus on innovation and entrepreneurial skills is relevant to small, start-up businesses, but can be poorly suited to fostering innovation within large civil engineering organizations.

• The emphasis on hands-on experiences in real world settings does not recognize the extra challenges of scale in providing these for civil engineering students.

• Although the programs talk of the need for developing “systems” skills in engineers, the actual teaching is in project management skills, avoiding the extra challenges civil engineers consider necessary to teach “systems” concepts to students.

• The “interdisciplinary” nature of educational projects between software or mechanical engineers and other disciplines is significantly less challenging than educational projects between civil engineers and the diverse range of other disciplines often involved in their projects (e.g., architects, sociologists, archaeologists, planners, ecologists).

It appears that the discussion on the engineering education revolution and its realization to date have neglected a thorough consideration of civil engineering education. The workshop organizer has recently published a “straw man” paper on the topic in Civil Engineering and Environmental Systems (DOI:10.1080/10286608.2017.1313246) to stimulate discussion on a civil-specific response to the need for education change, and to provide a starting point for workshop participation. Much of the same logic that is leading to change in software, electrical, and mechanical engineering education applies to civil engineering education, but the forms that it would take would need very different consideration.

A similar workshop was held in the UK at a national gathering of civil engineering educators in November 2017, and an Australasian workshop is intended for December 2018. The workshop will be supplemented by a survey sent to ASEE Civil Engineering members. A similar survey will have been distributed to U.K. engineering educators before the ASEE workshop.

Workshop schedule
9:00-9:15 a.m. Powerpoint overview presentation.
9:15-9:30a.m. . . . Participants give viewpoints from their institutions with a focus on what is happening and whether that is enough or not.

Free ticketed event
9:30-10:00 a.m. Break-out session (groups of 4-5) to consider what a civil-specific revolution might look like.
10:00-10:10 a.m. Reporting back with notes taken.
10:10-10:30 a.m. Discussion on further participation:
There will be a discussion of whether a working group should be formed to explore the matter further. If positive, there would be consideration of the scope (civil + environmental?), terms of reference, whom to invite (e.g., ASCE?), and what a suitable output and end-point for the working group would be.
Outcomes
An intercontinental paper will be developed on this and other workshops for presentation at the 2019 ASEE Conference, and North American co-authors will be sought at the workshop. The survey effort on the three continents and its findings will be submitted to a peer-reviewed journal, and again, co-authors will be sought at the workshop.

Free ticketed event

**U2109J - SUNDAY WORKSHOP: Achieving Broader Impacts through Your Journal Publications**

9:00 a.m. - 12:00 p.m., Room 155 C, Convention Center - Salt Palace
Sponsor: Sponsored Sessions
Speakers: Dr. Lisa Benson, Clemson University; Dr. Maura Borrego, University of Texas, Austin; Dr. Cynthia J. Finelli, University of Michigan

While publishing the results of an engineering education research project in archival journals is not considered the most impactful practice, publishing is a reality of academic life. This session is designed to help engineering education researchers achieve broader impacts and boost the visibility of their research by leveraging features of academic publication such as titles, abstracts, and keywords, as well as impact factors and citation tracking. Other topics include the benefits and drawbacks of publishing in open access journals, and how to use social media to promote journal publications and disseminate research to diverse audiences. The session will be organized to be highly interactive, using games, small group discussions, and brief individual exercises to help participants learn and apply the information.

Free ticketed event

**U2109L - SUNDAY WORKSHOP: Getting Started with IoT for Research and Teaching**

9:00 a.m. - 12:00 p.m., Room 254 A, Convention Center - Salt Palace
Sponsor: Sponsored Sessions
Speakers: Jeff Branson, Sparkfun Electronics, Inc; Hans Scharler, MathWorks; Dr. Gerald W. Recktenwald, Portland State University

The workshop will be highly interactive and hands-on. Attendees will receive a wi-fi-enabled microcontroller, sensor, and actuator that will be used during the workshop. The major activities are

1. A brief introduction to IoT: what it is and what it can be used for in a research and teaching environment
2. A series of hands-on experiments with a wi-fi-enabled IoT development board and Thinkpeak, cloud-based data storage and analytics environment.
3. Demonstrating communication protocols by connecting to the cloud to send simulated data and receive data stored in the cloud.
4. Reading from a sensor and send real-time data to the cloud.
5. Using accumulated cloud data to control an actuator (servo motor) or LED or other indicator.
6. Digging deeper into Thingspeak data and analytics. Attendees will get an introduction to the analytical and visualization tools available to work with large data sets obtained from distributed IoT sensors and systems.
7. Expanding local IoT nodes to interact with both cloud data and other IoT nodes in the immediate environment.

Activities are used in undergraduate materials science and engineering classes at the University of California, Davis, Purdue University, and in a high school materials science summer camp at the University of Illinois, Urbana-Champaign.

Other topics include the benefits and drawbacks of publishing in open access journals, and how to use social media to promote journal publications and disseminate research to diverse audiences. The session will be organized to be highly interactive, using games, small group discussions, and brief individual exercises to help participants learn and apply the information.

Free ticketed event
8. Debrief

Ticketed event: $25.00 advanced registration and $35.00 on site registration

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**U2109M - SUNDAY WORKSHOP: Introduction to Design Thinking**

9:00 a.m. - 12:00 p.m., Room 355 F, Convention Center - Salt Palace

**Sponsor:** Sponsored Sessions

**Speaker:** Mrs. Lueny Morell P.E.,

Many people think innovation, idea generation, and the creative process come naturally. The truth is these processes can be learned and enhanced with practice. Inventors like Thomas Edison and Steve Jobs were exemplary innovators who used a problem-solving process called “design thinking” to revolutionize entire industries and establish an enviable competitive advantage for their companies. Design Thinking refers to design-specific cognitive activities that designers apply during the process of designing. It is a methodology that is fast becoming a mainstay in business strategy all around the world. Centered around creativity, empathy, and putting the user’s needs at the heart of the problem, Design Thinking is seen as an important tool for driving innovation and sustained business growth. As the “business of innovation” becomes increasingly important to strategic decision makers in all sectors and industries, it is necessary for design thinking to become ingrained in the engineer’s mindset. Therefore, the design thinking culture should be integrated across the engineering curriculum beyond the capstone design experience. This half-day workshop is designed for STEM deans and professors who wish to learn about design thinking and how to integrate it in the curriculum. It is meant to give participants a full cycle through the design-thinking process in as short time as possible.

Ticketed event: $50.00 advanced registration and $60.00 on site registration

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**U2109N - SUNDAY WORKSHOP: K-12 Classroom and Outreach for Computer Science Concepts**

9:00 a.m. - 12:00 p.m., Room 355 C, Convention Center - Salt Palace

**Sponsor:** Sponsored Sessions

**Speakers:** Dr. Stephany Coffman-Wolph, University of Texas, Austin; Dr. Kimberlyn Gray, West Virginia University Institute of Technology

Children are familiar with computers, tablets, and smartphones. However, few understand the computer science concepts behind their favorite apps, games, and websites. This workshop will help K-12 teachers and those who do outreach with ideas for incorporating computer science (CS) concepts into their programs. Participants will complete several fun hands-on activities that have been successfully used within fourth- and fifth-grade classrooms. Participants will also learn content and receive suggestions for working with younger and older students. The workshop will cover the basics of binary numbers, cryptography using Caesar cipher and public key encryption, computer network terminology, mechanics of computer network message passing, computer security, and computer network topology. In addition, these activities promote teamwork and problem-solving skills, both extremely important for success in STEM fields and careers. The entire sequence is designed to fit into a one- to two-hour classroom time slot, but the activities can be broken into separate components for ease of adding to ongoing class curriculum or daily during a computer/technology week. The workshop will teach participants how to put together “kits” of all the materials necessary to successfully complete the activities with students. To appeal to K-12 teachers and outreach practitioners with minimal budgets, all materials for these activities are extremely low-cost. Additionally, the supplies are easily obtainable at a variety of stores and online and the majority of the supplies are reusable so only need to be purchased initially. Kits:

During the workshop participants will be taught to create a Computer Science Concept Kit. The majority of this kit contains one-time preparation and only a small portion needs to be replenished or refreshed. The materials for the kit are listed below:

**Supplies and Costs:**

- 2 Colors of Pony Beads
  - $5.00 per 1 pack of 750-1000 beads
- Key chain or bracelets
  - $3.00 per 1 pack of 28 key rings + $3.00 per 100 yds for 10 inch key chains for 30
- $3.50 per 50 ft for 60, 9-inch stretch bracelets
- White, Black, and Gray Plastic Party Hats
  - $1.00-2.00 per hat
- Lockable Box
  - $3.00-5.00 per box
- $1.00-5.00 for one luggage lock with two keys
- Prizes for Messages
  - $0.05 and up for stickers
- Matching pairs of erasers
  - $1.00-5.00 for 4-12 sets

(Alternative suggestions will be provided at the workshop.)

All items are easily available at a variety of stores or online. The listed cost per kit is $30.00-$70.00 for a class of approximately 30 students. Of the materials only $14.00-$20.00 need to be replenished between uses. Of the more expensive items (reusable and not), there are various lower-cost alternatives suggested.

Free ticketed event

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**U2109O - SUNDAY WORKSHOP: Teaching Math to Future Technology and Engineering Students**

9:00 a.m. - 12:00 p.m., Room 151 E, Convention Center - Salt Palace

**Sponsor:** Sponsored Sessions

**Speaker:** Dr. Andrew Grossfield P.E., Vaughn College of Aeronautics & Technology

Should mathematics and technology students be taught from the same texts, with the same viewpoint? Conventional pre-calculus and calculus texts are written by mathematicians with an aim of deriving logical proofs. On the other hand, technology and engineering students need to know and understand mathematical facts and be able to apply these
facts in the solution of analytical problems. The formality of current math texts is not user friendly and fails to meet the needs of students interested in technology, robotics or drones. This workshop is planned to address the needs of these technology students by providing their teachers with more acceptable explanations.

The workshop will be set up as follows:
1) Introduction by Andrew Grossfield, Ph.D., PE with a brief statement of his concerns and views.
2) Assessment of attendees’ attitudes concerning the clarity and compatibility of current math teaching materials and the needs of technology and engineering students. Is there a need for a new “math reform” designed by technicians and pre-college math teachers to better suit the needs of the teachers and students?
3) Discussion and organization of topics that the attendees feel need attention or clearer, more suitable explanations.
4) An introduction to the free computer graphing software WINPLOT.
5) A presentation of the slides described below.
6) The assessment of the workshop, including a discussion of how to proceed.

The slide presentations will offer pre-college faculty a natural conceptual structure of curves in a coordinate system and functions, emphasizing the definitions, kinds, forms, properties and operations of functions. In addition, the slides will provide faculty with visual interpretations of concepts as presented in my papers on “Visual Analysis.” Lastly if time permits, I will show slides displaying how most of the “rules” of differential calculus naturally fit the structure mentioned above and can be derived using simple algebra as presented in my paper “Calculus Without Limits” The papers can be found on the ASEE and CIEC websites. High School principals are welcomed as are non-analytical teachers assigned algebra classes.

Free ticketed event

**U2109P - SUNDAY WORKSHOP: Hands On with the Digilent Basys MX3: Using a Microcontroller in a Mechanical Engineering Data Acquisition Course**
9:00 a.m. - 12:00 p.m., Room 260 B, Convention Center - Salt Palace
Sponsor: Sponsored Sessions
Speaker: Dr. Gregory Mason, Seattle University

The Digilent Basys MX3 board is a versatile embedded systems platform that can be used for data acquisition and control. This workshop covers the basics of using the Basys MX3 platform and freeRTOS, and details how this hardware and software is currently being used in a Mechanical Engineering data acquisition and instrumentation course taught by Dr. Greg Mason at Seattle University.

The workshop will highlight four labs from the mechanical engineering course: multitasking and timing; experimentally determining the convective heat transfer coefficient of a sphere; measuring fundamental frequency of a vibrating beam; and implementing feedback control with a servomotor and encoder. Each lab will be discussed in detail with respect to learning its objectives and required hardware. Workshop participants will use a Basys MX3 board and freeRTOS in a series of hands-on activities related to these labs. Upon the conclusion of the workshop, participants will feel comfortable writing simple programs for the Basys MX3 using MPLAB X and freeRTOS, and understand how this platform can be used for data acquisition and control labs.

Participants should have some familiarity with C programming and operating system concepts. Participants will get to take home a Basys MX3 board and supporting hardware for all of the workshop labs, but will need to provide their own laptop, Mac or PC, capable of running MPLAB X.

Tickets for the workshop will be $50. Scholarship opportunities will be evaluated on a case-by-case basis. The workshop will be funded through ticket price and Digilent sponsorship.

Ticketed event: $50.00 advanced registration and $60.00 on site registration

**U2109Q - SUNDAY WORKSHOP: WeBWorK for Beginners! Using and Developing for the Open Problem Library**
9:00 a.m. - 12:00 p.m., Room 255 B, Convention Center - Salt Palace
Sponsor: Sponsored Sessions
Speakers: Dr. Agnes Germaine d’Entremont P.Eng., University of British Columbia, Vancouver; Dr. Michael K. Swanbom P.E., Louisiana Tech University; Luis Linares, University of British Columbia

This hands-on workshop will cover how to both use existing problems and develop new problems for WeBWorK. WeBWorK is an open online homework system, which was developed for math and is increasingly being used for engineering courses. Facilitated by instructors who are developing problems and using WeBWorK in their courses, this workshop will allow participants to acquire the key knowledge needed to start developing and contributing their own problems to the public problem bank known as the Open Problem Library. We hope to generate momentum in the engineering community to eventually build substantial problem banks for all disciplines/subjects in engineering.

Ticketed event: $7.00 advanced registration and $17.00 on site registration

**U2109R - SUNDAY WORKSHOP: Interactive Workshop on Crafting a Competitive NSF STEM Education Proposal**
9:00 a.m. - 12:00 p.m., Room 151 A, Convention Center - Salt Palace
Sponsor: Sponsored Sessions
Speakers: Abby Ilumoka, NSF Division of Undergraduate Education; Stephen Turley, National Science Foundation; Julie Martin, National Science Foundation; Dr. Paige E Smith, National Science Foundation

Interactive workshop on crafting a competitive NSF STEM education proposal.

Free ticketed event
U2109S - SUNDAY WORKSHOP: Management and Assessment of Capstone Design Made Easy Using Specific and Generic Performance Indicators
9:00 a.m. - 12:00 p.m., Room 255 F, Convention Center - Salt Palace
Sponsor: Sponsored Sessions
Speaker: Mr. Wajid Hussain,

Capstone design is a very complex, culminating practical student learning experience that constitutes several aspects of engineering activity corresponding to all three domains of the Bloom’s taxonomy. By applying several specific and generic performance indicators, specializations in any engineering discipline can comprehensively manage and assess several specific engineering activities aligned to required engineering content and skills levels in various phases of the capstone design process. Employing specific and generic performance indicators in a structured format using the authentic OBE power principle of “design down” conveniently facilitates student achievement of ABET’s requirement for final design fulfillment of realistic constraints such as safety and health, environmental, sustainability, economic etc. This presentation will cover several examples from the civil, electrical, and mechanical engineering disciplines detailing application of performance indicators for the management and assessment of various phases of the design process, such as: defining the problem and formulation; conducting a literature review; selecting and evaluating design concepts; developing a mathematical/simulation model; analyzing issues related to manufacturability; manufacturing the prototype as per design specifications; and evaluating the final design in detail for fulfillment of functionality, safety and health, economic, sustainability, and environmental and societal constraints. Several activities related to presenting capstone projects such as writing technical reports, making effective oral and poster presentations, and working in teams will also be covered. The necessity of the use of performance indicators is highlighted especially in reference to the measurement of capstone course learning outcomes, alignment with teaching and learning activities and development of assessments.
In summary, this workshop presents the benefits of using a combination of specific, generic performance indicators and their rubrics to conveniently manage and accurately assess complex capstone design student engineering learning activities related to the ABET design outcomes, while supporting the principles of authentic OBE, scientific constructive alignment, efficient performance failure analysis, and continuous quality improvement.
Free ticketed event

U2113B - SUNDAY WORKSHOP: Using Active Case Studies to Integrate Systems Approaches into Non-Systems Engineering Classes
9:00 a.m. - 12:00 p.m., Room 150 B - Sponsor Tech Room, Convention Center - Salt Palace
Sponsor: Design in Engineering Education Division
Speakers: Prof. Reid Bailey, University of Virginia; Prof. Michael C Smith, University of Virginia; Dr. William T. Scherer, University of Virginia; Dr. Cody H. Fleming, University of Virginia; Dr. William H Guilford, University of Virginia; Prof. Dana M. Elzey, University of Virginia; Dr. Scott T Acton, University of Virginia; Dr. Brian L. Smith P.E., University of Virginia; Prof. James W. Lark III, University of Virginia; Shawn Russell, University of Virginia

The focus of this workshop is integrating systems approach principles and content into non-systems engineering courses using a case study pedagogy. Participants should leave with a clearer understanding of what a systems approach is and how it can be integrated into existing engineering courses.
Systems Context
Systems thinking is a critical differentiator for engineering leaders. It is not owned by anyone or any discipline. Its power lies in its applicability to any problem; in particular, the most complicated multi-objective, multi-stakeholder large-scale problems facing society. In industry, the most influential engineers who rise to leadership invariably learn to view problems as systems. They are able to combine outstanding technical skills with a systems perspective.
The current state of engineering education, however, is famous for its focus and specialization. This focus is no accident; the requisite knowledge to be an engineer requires deep understanding. In this juxtaposition—a need for systems thinkers and a curriculum for specialists—lies the problem, the challenge, and the opportunity.
We are not the first to recognize this need; in fact, it is a national focus. One can find the call for a systems approach in multiple National Academy of Engineering publications [1]–[3] and throughout most of the Grand Challenges for Engineering [4]. The demand for systems engineering in both the Department of Defense [5] and NASA [6] is evident by the offices in each focused on systems engineering. Finally, the many calls for “T-shaped” engineers frequently focus on how to produce engineers with the top bar of the T, not just the vertical depth. Marshall Lih, former director of NSF’s engineering education division, captured the need for engineers who take a systems approach by saying that “narrowly trained engineers in America tend to be subordinate to other professions… [and] are ill-equipped to fill top jobs in business
or industry.” [7].

Systems Approach
As defined here, a systems approach is a “top-down, goal-oriented” method that operationalizes system thinking “to solve complex problems in the context of multiple stakeholders with competing and conflicting objectives where significant trade-offs are required to achieve acceptable outcomes under uncertain and changing conditions.” [8].

“In the systems approach, concentration is on the analysis and design of the whole, as distinct from ... the components or parts ... The systems approach relates the technology to the need, the social to the technological aspects; it starts by insisting on a clear understanding of exactly what the problem is and the goal ... It provides for simulation and modeling so as to make possible predicting the performance before the entire system is brought into being. And it makes feasible the selection of the best approach from the many alternatives.” Simon Ramo, Cure for Chaos, pp. 11, 12 [9]

The workshop focuses on a “systems approach” as a process that operationalizes the broader topic of systems thinking [10]. The overall systems approach has been turned into many specific systematic methodologies and tools using names such as systems analysis, systems life-cycle, systems integration, and systems dynamics modeling. The systems approach as used in this workshop, however, aims first to be systemic in its embodiment of systems thinking. This is in contrast to many systematic approaches, whose focus on process manifests in a mechanistic set of steps or reliance on a narrow set of tools. Fundamentally, a systems approach is focused on improving systems performance. As such, the approach used in this workshop focuses on foundational questions related to this purpose such as:

- What is the system?
- How should performance of the systems be measured?
- How does the system perform now?
- What does a well-performing system look like?
- What trade-offs represent improvement?

Free ticketed event

U214A - SUNDAY WORKSHOP: Teaching Metacognition – Helping Students Own and Improve their Learning
9:00 a.m. - 12:00 p.m., Room 151 C, Convention Center - Salt Palace
Sponsor: Educational Research and Methods Division
Speakers: Dr. Patrick Cunningham, Rose-Hulman Institute of Technology; Dr. Holly M Matusovich, Virginia Tech; Sarah Anne Williams, Virginia Tech

At the completion of the session, participants will be able to: 1) define and describe key elements of metacognitive learning, 2) articulate best practices for engaging students in their metacognitive development, 3) adapt instructional materials for the participant’s own teaching context, 4) identify types of responses students may give to prompts eliciting self-examination of their approaches to learning, 5) formulate constructive and positive formative feedback to support student development as learners, and 6) explain how seeing students develop as learners can make teaching more rewarding.

Metacognition is often used as a nebulus term referring to “thinking about thinking,” but this description obscures its function and utility in learning. Broadly, but more specifically, metacognition involves our knowledge and regulation of our thinking processes. While everyone is metacognitively active to one degree or another, we all have room to grow and benefit from improving our metacognitive skills. In particular, many students persist in predominantly using surface approaches to learning, such as rehearsal and memorization, but could benefit greatly from more elaborative and organizational approaches associated with deeper learning (e.g., transferable and lasting learning). This workshop focuses on understanding metacognition, modules instructors can use to engage students in their metacognitive development, and a tool for providing supportive feedback to students about their approaches to learning. Findings from our National Science Foundation-funded research inform this workshop.

This will be an interactive session, alternating between brief instructional periods, individual and group work time, and open discussions. In the first half of the workshop participants will learn about metacognition by taking part in a subset of modules developed as part of the NSF-funded research project for engaging students in their metacognitive development. There are six modules in total, each composed of a short video with reflective questions, an in-class activity, and a post-class assignment. Importantly, the modules are designed to fit within existing courses. All questions and activities are aimed at increasing students’ self-awareness of their learning processes, improving the accuracy of students’ self-assessments of learning, or providing opportunities to practice metacognitive skills. Participants will complete one module, using a student perspective, which will set up the second half of the workshop.

In the second half of the workshop, participants will practice assessing their imagined student responses and actual student responses to prompts about their metacognitive awareness and behavior. Then participants will practice generating positive and constructive formative feedback in support of students’ metacognitive development. These assessments and feedback will be grounded in the metacognitive indicator rubric, a tool developed to aid instructors in efficiently generating meaningful feedback for students. Significant time in the second half will be devoted to engaging participants in adapting materials to their context, sharing their products, and supportive discussion.

Acknowledgements: This workshop is based on research supported by the National Science Foundation under Grant Nos. 1433757, 1433645, & 1150384. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.

Free ticketed event

U214B - SUNDAY WORKSHOP: Build to Last – Strategies for Sustaining Innovative Educational Initiatives
9:00 a.m. - 12:00 p.m., Room 255 A, Convention Center - Salt Palace
Sponsor: Educational Research and Methods Division
Speakers: Dr. Brian Yoder, ASEE; Dr. Jeffrey Froyd, Ohio State University; Dr. Sarah E Zappe, Pennsylvania State University, University Park; Dr. Daria A Kotys-Schwartz, University of
Funding agencies such as the National Science Foundation are increasingly emphasizing accountability for monies granted to ensure that investments extend beyond the length of the funding period. Calls for educational innovations in STEM such as the NSF RED (Revolutionizing Engineering and Computer Science Departments) program include institutional commitment and potential for sustainability as elements in the proposal review criteria. An additional large-scale initiative with institutionalization as a goal is NSF ADVANCE. The purpose of this workshop is to provide attendees with the skills to better design educational initiatives, beginning with the initial project planning phase, that have the potential to increase the likelihood of sustaining the initiative.

Workshop presenters will discuss data collected as part of the Increase the Impact project, a four-year NSF-sponsored project focused on developing resources designed to help project investigators propagate and sustain their educational initiatives. Results from a survey of PIs and co-PIs of NSF STEP (STEM Talent Expansion Program)-funded projects will be presented to help identify a set of project elements and processes that have facilitated the continuation of projects after formal grant funding periods have ended. This data will be used as an introductory basis for which attendees will identify and develop strategies that will enable them to build project plans with sustainability in mind. This workshop will likely be of interest to individuals who are starting new educational initiatives and would like to build these with project continuation in mind as well as individuals with already started educational initiatives who would like to consider how to gain institutional support for project continuation.

Free ticketed event


9:00 a.m. - 12:00 p.m., Room 257 B, Convention Center - Salt Palace

Sponsor: Educational Research and Methods Division

Speakers: Dr. Cheryl Carrico P.E., Virginia Tech; Dr. Samantha Ruth Brunhaver, Arizona State University, Polytechnic campus; Rohini Abhyankar, Arizona State University

The purpose of this workshop is to engage participants in conversations and practice sessions on operationalizing and implementing the work proposed in large-scale mixed methods research studies. Grant proposals typically involve more than one person and many early career professionals are expected to manage complex projects with little or no academic project management experience. This workshop will outline considerations for managing a successful project, provide examples from real projects, and have participants work through project management steps on a project they may want to propose.

Free ticketed event

**U214D - CANCELLED - SUNDAY WORKSHOP: Integrating Grounded Theory Development and Mixed Methods**

9:00 a.m. - 12:00 p.m.
with qualitative, quantitative, or mixed methods research, and who are interested in exploring research quality questions that cut across all three of these approaches.

Free ticketed event

**U214F - SUNDAY WORKSHOP – ERM Presents: Moving Beyond Research Ideas**
9:00 a.m. - 12:00 p.m., Room 355 B, Convention Center - Salt Palace

**Sponsors:** Educational Research and Methods Division; Biomedical Engineering Division

**Speakers:** Dr. Courtney June Faber, University of Tennessee, Knoxville; Dr. Erin McCave, University of Houston (CoE & CoT)

This workshop will be broken into two parts. The first part will review principles of engineering education research design, focusing on the development of meaningful research questions and selecting appropriate research methods. We will provide vignettes of engineering education research studies to represent research methods common to engineering education.

In the second part of the workshop, participants will have the opportunity to develop their own research questions and a strategy for addressing them. This will be done through a series of small group discussions designed to give participants iterative feedback so they can develop a strategy to address their research interests. The discussions will begin with participants posing a question of interest, followed by refining the question and identifying possible research methods that align with the question.

Ticketed event: $15.00 advanced registration and $25.00 on site registration

**U215A - SUNDAY WORKSHOP: Applications of the Analog Discovery Board to Upper-Level Electrical Engineering Courses: A Hands-On Workshop**
9:00 a.m. - 12:00 p.m., Room 151 D, Convention Center - Salt Palace

**Sponsor:** Electrical and Computer Division

**Speakers:** Dr. Steven Holland, Milwaukee School of Engineering; Dr. Cory J. Prust, Milwaukee School of Engineering

The Digilent Analog Discovery Board combines a full suite of electronic measurement tools into a portable USB-powered device that is smaller than a graphing calculator and can be purchased for the cost of a textbook. A student's laptop provides instrument control and data display, processing, and storage. This unique device has ushered in a new individualized electronic measurement paradigm, where experiments can move beyond traditional laboratories to in-lecture hardware activities and mobile-studio lab formats. To date, this novel educational pedagogy has only been applied to lower-level introductory circuits and digital logic courses.

This workshop will present interactive sample experiments that unlock the educational potential of the Analog Discovery board paradigm in upper-level electrical engineering coursework. Through these measurement activities, students explore complex concepts from courses such as signals and systems, communication systems, digital signal processing, analog electronics, electromagnetics, and control systems. We will describe the basic measurement techniques that maximize the pedagogical benefits of the Analog Discovery board, will share example projects, and will lead workshop attendees through several hands-on exercises.

The session will conclude with an interactive discussion in which workshop participants brainstorm applications of the Analog Discovery within their own upper-division courses. Participants will leave the workshop with their own complimentary Digilent Analog Discovery board and example projects that they can apply to their own coursework.

Ticketed event: $50.00 advanced registration and $60.00 on site registration

**U216 - SUNDAY WORKSHOP: Wind Energy Presentation and Activity for K-20 Outreach**
9:00 a.m. - 12:00 p.m., Room 258, Convention Center - Salt Palace

**Sponsor:** Energy Conversion and Conservation Division

**Speakers:** Dr. Lynn A Albers, Campbell University; Dr. Reg Recayi Pecen, Sam Houston State University; Mr. Jeremy Ryan England

The first part of the workshop provides an introduction to the history and evolution of wind turbines, policy, current industry standards and basic design criteria. The presenter will provide intellectual property in the form of a PowerPoint presentation that has been used in numerous STEM summer camps and outreach events. This presentation, which has been fine-tuned over a decade, is primarily for grades 3-8 but can be scaled for use with any K-20 audience. The presenter also utilizes the windmill building activity from Engineering is Elementary’s kit “Catching the Wind” to complement the PowerPoint and provide a fun, hands-on activity for the audience to learn the Engineering Design Process. Workshop participants will engage in the activity and the presenter will share lessons learned when using this activity with groups.

For the second part of the workshop, the presenter will provide detailed information on design and implementation of previously completed year-long senior design projects of small-scaled, stand-alone and grid-tied wind energy systems in an ABET-ETAC-accredited B.S. in EET program. The projects satisfy multiple sections of ABET-ETAC criteria successfully while promoting STEM in renewable energy applications. The presenter will also share a sample curriculum and course material for a wind energy engineering class taught for B.S. in EET and ET programs. The wind energy engineering course material is available online for public use through a google site. The site also includes a real-time data acquisition of 10 kW Bergey wind turbine generator unit installed on a university campus. The workshop participants will learn how to start designing and implementing small-scale wind turbine projects on and off campus using local and regional funding resources. A brief review of solar-wind hybrid senior design projects will also be introduced for year-long senior design projects. Finally, a wind energy curriculum promoting clean energy technologies for a general education course appropriate for all majors will be introduced. The curriculum described in this workshop includes challenges on transmission system infrastructure, wind variability factors, wind turbine and tower manufacturing, stand-alone and grid tie interconnection issues, and needs on workforce development in all three levels - technician, engineering technologist, and engineering.

Schedule subject to change: Please go to [www.asee.org/icp](http://www.asee.org/icp) for up to date information
Conference Sessions

U218 - SUNDAY WORKSHOP: Understanding the Basic Concepts of Engineering Graphics
9:00 a.m. - 12:00 p.m., Room 150 E, Convention Center - Salt Palace
Sponsor: Engineering Design Graphics Division
Speakers: Dr. Steven Nozaki, Penn State Erie, The Behrend College; Dr. Nancy E. Study, Penn State Erie, The Behrend College
Session Description
- Do your students need to understand the basic concepts of Engineering Graphics?
- Would you like a way to assess your students’ understanding of Engineering Graphics concept?
Through this interactive session, we will outline the process used in the development of the Engineering Graphics Concept Inventory instrument and allow participants to access and explore the instrument. We will assist participants with appropriate data analysis so results of the instrument can be applied to their teaching.
You will learn:
- What is a concept Inventory?
- What is the Engineering Graphics Concept Inventory?
- How can I use the Engineering Graphics Concept Inventory with my students?
- How can the results be applied to my teaching?
Bring your smart phone or connected device (Wi-Fi may not be available).

Free ticketed event

U221 - SUNDAY WORKSHOP: The Fundamentals of Engineering Librarianship
9:00 a.m. - 12:00 p.m., Room 260 A, Convention Center - Salt Palace
Sponsor: Engineering Libraries Division
Speakers: Mr. Kevin P Drees, Oklahoma State University; Mr. Tom C. Volkening, Michigan State University; Mr. Mel DeSart, University of Washington
This workshop will focus on helping newer engineering librarians learn skills needed to serve engineering students and faculty. The workshop will be led by three or four seasoned engineering librarians.
Free ticketed event

U226 - SUNDAY WORKSHOP: Your Head in the Clouds – A Hands-on Workshop on Using IoT Devices as Teaching Aids
9:00 a.m. - 12:00 p.m., Room 151 F, Convention Center - Salt Palace
Sponsor: Experimentation and Laboratory-Oriented Studies Division
Speaker: Dr. Gerald W. Recktenwald, Portland State University
This workshop will consist of four separate sections over a period of four hours:
1. An introduction to IoT, what it is and what it can be used for in a teaching environment.
2. A hands-on experiment using a IoT development board (currently a Particle Photon, which costs $19) assembled onto a prototype board capable of being controlled via an Internet interface, e.g., by smart phone or a laptop. The project will use simple hardware, such as turning on an LED, to demonstrate how IoT devices work and to demonstrate how quickly you can get hooked up on line (≤20 minutes).
3. Building on the simple example, a more complex project will combine inputs from workshop participants into a simple quiz “voting” system. This project demonstrates how IoT devices provide data input to online analytics.
4. A final demonstration will use readily available data sources to show existing, larger scale implementations of IoT.
Depending on vendor sponsorships, we will include a display of existing IoT hardware and software.
Free ticketed event

U233 - SUNDAY WORKSHOP: Workshop Using the WISEngineering Online Learning Environment
9:00 a.m. - 12:00 p.m., Room 150 G, Convention Center - Salt Palace
Sponsor: Pre-College Engineering Education Division
Speakers: Dr. M. David Burghardt P.E., Hofstra University; Xiang Fu; Ellen Furuya
As part of a NSF project, Wise Guys & Gals—Boys and Girls as WISEngineering STEM Learners, we have a developed an open-source learning environment, WISEngineering, as well as 15 STEM activities in the environment that feature engineering design and STEM careers. The activities have a virtual component, hands-on construction, and reflection following testing and evaluation of the STEM design projects. WISEngineering is accessible from computers and tablets and has many attractive features for learners as well as for facilitators. A link shows the range of activities and many embedded features of the environment, https://wgg3.hofstra.edu/portal/pages/index.php. WiSEngineering and WGG are open source and freely available for others to adopt or adapt. Some other highlights/features: The materials are inexpensive and easily available; designed for middle school grade level, they could be used by upper elementary and early high school; included is a social networking-like feature that allows for sharing of pictures and videos about the activity; the activities are designed to make engineering design activities easily available for informal learning environments; the activities are fun and engaging for youth, and do not require a STEM trained facilitator to implement them because of the robust virtual professional development support structure.
Ticketed event: $25.00 advanced registration and $35.00 on site registration

U240 - Sunday Workshop: Co-designing a Research Agenda to Amplify Engineering Education Efforts at HSIs
9:00 a.m. - 12:00 p.m., Room 257 A, Convention Center - Salt Palace
Sponsor: Minorities in Engineering Division
Speakers: Dr. Meagan R. Kendall, University of Texas, El Paso; Ines Basalo, University of Miami; Dr. Alexandra Coso Strong, Franklin W. Olin College of Engineering; Miss Michele Carolyn Williams; Gemma Henderson, University of Miami; Prof. Derin Ural, University of Miami
Ticketed event: $20.00 advanced registration and $30.00 on site registration

Schedule subject to change: Please go to www.asee.org/icp for up to date information
Research on engineering education reform highlights the importance of understanding barriers to change and the impacts of the environmental, historical, and systemic constraints on reform efforts (Besterfield-Sacre, Cox, Borrego, Beddoes, & Zhu, 2014). In addition, research on educational change emphasizes that effective strategies for reform require alignment with the beliefs of the individuals involved or must seek to change those beliefs (Henderson, Beach, & Finkelstein, 2011). With that in mind, there exists a need to learn from individuals who would benefit from and/or engage with future research at Hispanic-serving institutions (HSIs)—the engineering educators themselves. As a result, this workshop will be targeted toward engineering educators from HSIs who are not necessarily engaged in engineering education research or scholarship.

By doing so, our intent is to engage with engineering educators at HSIs to leverage design-thinking methodologies to better understand the HSI institutional context and co-develop curricular experiments and research needs that can ultimately improve undergraduate engineering education. During this workshop, participants will be given a chance to test out three innovative approaches to supporting student learning that are independent of specific pedagogies or tools: design thinking (Razzouk & Shute, 2012), intrinsic motivation (Ryan & Deci, 2000), and students as empowered agents (Bandura, 2006). To garner their genuine perspective on the feasibility of enacting educational reform that embraces these concepts, participants will have the opportunity to actively design a class assignment that applies these impactful ideas. By having participants actively design an activity for their course and reflect on mechanisms for amplifying these ideas on their campus, we anticipate that participants will be able to more accurately assess the opportunities and limitations of implementing these approaches at HSIs. Finally, based on collecting and analyzing participant reactions to these impactful ideas, a list of barriers still needing attention and successes worth amplifying will be extracted and reported the broader engineering education community.

Free ticketed event

U245 - SUNDAY WORKSHOP: Projects Based Arduino Activities
9:00 a.m. - 12:00 p.m., Room 150 C - Sponsor Tech Room, Convention Center - Salt Palace
Sponsor: Engineering Physics and Physics Division
Speakers: Dr. Carl K Frederickson, University of Central Arkansas; Dr. Bala Maheswaran, Northeastern University

A basic knowledge of Arduinos or other similar systems is essential to any engineering program and engineering projects in the ever-evolving electronic world. Engineering and science students are often using Arduinos in class activities and projects. This workshop will focus on introducing the Arduino as the data acquisition platform in freshman engineering physics and engineering courses. The workshop will emphasize how the Arduino can be used in the laboratory portion of the introductory physics and engineering courses. An overview of the Arduino system will be presented along with hardware necessary to interface with equipment already available in many freshman laboratories. A number of sample projects will be presented. Some interactive, hands-on activities will demonstrate how to apply the knowledge. Participants will need to bring a laptop with the Arduino sketch software (ARDUINO 1.8.5) installed. This software is available as a free download at https://www.arduino.cc/en/Main/Software.

Ticketed event: $25.00 advanced registration and $35.00 on site registration

U249 - SUNDAY WORKSHOP: Creating Engineering Classes Open to Non-Engineers
9:00 a.m. - 12:00 p.m., Room 255 E, Convention Center - Salt Palace
Sponsor: Technological and Engineering Literacy/Philosophy of Engineering Division
Speaker: Dr. John Krupczak Jr, Hope College

This hands-on session supported by a National Science Foundation grant will help participants develop a plan for a general-education Introduction to Engineering course that is open to both engineers and non-engineers. The goal is to help participants to create an introductory engineering course that serves both the general education needs of non-engineers and the career objectives of engineering students. The workshop is oriented toward engineering faculty at liberal arts colleges, community colleges, and other engineering programs that serve a broad campus audience. Key factors in attracting and promoting courses to non-engineers will be described. Participants will be able to create an outline of a course structure consistent with their institutional environment. Examples of successful implementations will be reviewed. Resources for obtaining appropriate supporting materials will be provided. Other issues addressed will include: balancing technical depth with engineering breadth, teamwork issues, structuring design projects to include non-engineering majors, and assessment methods. The session leaders are experienced in developing and teaching general-education introductory engineering courses.

Free ticketed event

U252 - SUNDAY WORKSHOP: Social Innovation and Entrepreneurship – Models, Practices and Opportunities for Integration in Engineering Education
9:00 a.m. - 12:00 p.m., Room 252, Convention Center - Salt Palace
Sponsor: Community Engagement Division
Speakers: Khanjan Mehta; Miguel Gonzalez, Corporacion Universitaria Minuto de Dios; Dr. Nicole Smith, Colorado School of Mines; Dr. Breanne Przestrzelski, University of San Diego; Dr. Juan C. Lucena, Colorado School of Mines

Even though there is an explosion of interest in I&E among engineering schools, there is no clear understanding of how industry-oriented I&E differs from social I&E, what kinds of models and practices of social I&E are available, and how to integrate these in engineering curricula and projects. After introducing the basics of social I&E, workshop facilitators will work with groups of participants in developing a social innovation and proposing possible enterprises that will bring social change to vulnerable communities in a developing world setting. Although social I&E should be developed and implemented WITH communities (and other relevant stakeholders), this workshop will use hypothetical community development scenarios given our time and space limitations. Through this exercise, participants will have the opportunity to assess and reflect on where and how they can integrate social I&E in their own educational contexts and on the opportunities...
and challenges of doing so in the community engagement courses, projects and programs.
Ticketed event: $5.00 advanced registration and $15.00 on site registration

**U255 - SUNDAY WORKSHOP: Designing Transformational Leadership Programs for Engineering Undergrads**
9:00 a.m. - 12:00 p.m., Room 259, Convention Center - Salt Palace
**Sponsor: Engineering Leadership Development Division**
**Speaker: Ms. Louise M Morman, Miami University**
Transformational leadership development for engineers and computer scientists has the potential to refresh and reinvent the undergraduate engineering educational experience and enhance the leadership workforce at all levels. Built on the principles of personal development and growth, rather than traditional teaching methods, transformational development approaches challenge students to develop their leadership skills through personal growth. Undergrads who complete such programs leave their academic environment with not only knowledge from their scholarly discipline, but also skills applicable to their future professions by actively engaging the student in the development of self-awareness, perseverance, and connectedness. In this way, transformational leadership programs cultivate leaders who will flourish in their professional and personal lives by encouraging individuals to think strategically, work collaboratively, communicate their ideas effectively, and find innovative solutions to complex problems.
Free ticketed event

**U255B - SUNDAY WORKSHOP: We Survived the Crisis! Using a Multi-Campus Crisis Simulation to Teach Leadership**
9:00 a.m. - 12:00 p.m., Room 255 C, Convention Center - Salt Palace
**Sponsor: Engineering Leadership Development Division**
**Speakers:** Dr. Eva Andrijic, Rose-Hulman Institute of Technology; Dr. Julia M. Williams, Rose-Hulman Institute of Technology; Dr. Kyle G. Gipson, James Madison University; Dr. Ebenee Williams, University of California, San Diego.

This workshop will introduce attendees to the Crisis Simulation activity developed by the Leadership Education and Development Program (LEAD) at Rose-Hulman Institute of Technology. Over the last four years this activity has resulted in four distinct interactive crisis exercises, and has been tested in three versions in three different institutions: as an extracurricular activity (at Rose-Hulman Institute of Technology), as a training component of a graduate class (at James Madison University), and as a testing component of graduate and undergraduate classes (at University of California, San Diego).
The goal of the activity is to expose students to the types of leadership roles that they might have to assume, or might be exposed to, in an unplanned crisis event. Exposed to an unfamiliar crisis situation in an environment which is meant to simulate realistic conditions, student teams are led by volunteer faculty and staff through an intense two-hour experience in which they assume roles of leadership in a community, business, or organization. Each of the four distinct crisis exercises exposes students to a different problem, and provides them with different tools to manage that problem. However, the overarching learning objectives of the exercises are the same. Our workshop at ASEE 2018 will introduce attendees to the leadership pedagogy that underlies the simulation, and the planning efforts that are required to develop and execute this activity. We will also run the attendees through a “mini-simulation” that will give them a first-hand experience with the activity. Finally, we will share with them the logistics and other preparations that go into the simulation. The facilitators have had experience with developing and facilitating this activity on individual campuses, as well as facilitating a synchronous simulation between three universities.
Our intention is to encourage attendees to join us and use our simulation as we develop a multi-campus collaborative effort that contributes to the development of students’ leadership abilities.
Free ticketed event

**U280 - Sunday Workshop: Leading Through Partnerships – Accomplishing Together what Cannot Be Achieved Alone**
9:00 a.m. - 12:00 p.m., Room 150 A - Sponsor Tech Room, Convention Center - Salt Palace
**Sponsor: Faculty Development Constituency Committee**
**Speakers:** Elizabeth Harris, University of Wisconsin-Madison; Dr. Ken Yasuhara, University of Washington; Dr. Stephanie Pulford, University of California, Davis; Dr. Wendi M. Kappers, Embry-Riddle Aeronautical Univ., Daytona Beach; Dr. Stephanie Cutler, Pennsylvania State University, University Park

This is an interactive workshop that will bring together leaders and other members of teaching and learning centers that support and promote engineering education. The focus of the workshop will be how to better identify, foster, and leverage strategic partnerships within attendees' institutions, and, more broadly, to achieve their engineering education and faculty development-related goals.
Many times partnerships are only considered once a problem and solution have been identified. Then other groups with similar problems who are interested in a similar solution can be identified. Through applying a systems engineering lens and a multi-layered definition of the system, this workshop will help attendees step back and view the landscape in which teaching and learning centers and faculty developers operate differently. This often makes ways to address not only mission-critical opportunities and challenges visible, but it also address subter, more systemic issues that are often considered too ingrained to change, such as lack of trust across organizations or poor communication channels. Many centers face similar opportunities and challenges as part of their missions, but address them in unique ways. This workshop will not only bring in ideas for consideration, but will also provide spaces for participants to learn from one another.
**Target Audience:** Faculty developers and other members of teaching and learning centers or those doing faculty development work.
Free ticketed event

**U93B - ASEE Board of Directors Meeting**

Schedule subject to change: Please go to www.asee.org/icp for up to date information
Sunday, June 24

U310 - CPDD Board Meeting
12:00 p.m. - 4:00 p.m., Room 251 A, Convention Center - Salt Palace
Sponsor: Continuing Professional Development Division
CPD Board Meeting
Free ticketed event

U3108A - PIC I Business Meeting and Lunch
12:00 p.m. - 1:00 p.m., Salon A, HQ Hotel - Marriott at City Creek
Sponsor: Professional Interest Council
PIC I Business Meeting and Lunch
Free ticketed event

U3108B - PIC II Business Meeting and Lunch
12:00 p.m. - 1:00 p.m., Salon B, HQ Hotel - Marriott at City Creek
Sponsor: Professional Interest Council
PIC II Business Meeting and Lunch
Free ticketed event

U3108C - PIC III Business Meeting and Lunch
12:00 p.m. - 1:00 p.m., Salon C, HQ Hotel - Marriott at City Creek
Sponsor: Professional Interest Council
PIC III Business Meeting and Lunch
Free ticketed event

U3108D - PIC V Business Meeting and Lunch
12:00 p.m. - 1:00 p.m., Salon H, HQ Hotel - Marriott at City Creek
Sponsor: Professional Interest Council
PIC V Business Meeting and Lunch
Free ticketed event

U3108E - PIC IV Business Meeting and Lunch
12:00 p.m. - 1:00 p.m., Salon G, HQ Hotel - Marriott at City Creek
Sponsor: Professional Interest Council
PIC IV Business Meeting and Lunch
Free ticketed event

U380 - Faculty Development Constituency Committee Lunch
12:30 p.m. - 2:30 p.m., Offsite, Salt Palace Convention Center, South Entrance
Sponsor: Faculty Development Constituency Committee

Free ticketed event

U396 - GREET THE STARS! New Members and First-time Attendees Lunch
12:00 p.m. - 1:00 p.m., Grand Ballroom I, Convention Center - Salt Palace
Sponsor: ASEE Headquarters
GREET THE STARS! New Members and First-time Attendees Lunch
Ticketed: (By invitation only)
Are you a New Member or a First-Time Attendee? Join your friends, colleagues, and the ASEE Board of Directors at this special luncheon. We will discuss an overview of the ASEE Annual Conference and benefits of membership. Anyone who joined ASEE for the first time since January 1, 2018 and/or is a First-time Annual Conference Attendee is eligible to attend.

Free ticketed event

U401 - Aerospace Division Technical Session
1:15 p.m. - 2:45 p.m., Room 253 A, Convention Center - Salt Palace
Sponsor: Aerospace Division
Moderator: Sharan Asundi, Tuskegee University
Aerospace Division technical session.
Engaged Student Learning in Dynamics of Flight and Control
Dr. Shawn S. Keshmiri, University of Kansas
Aaron Blevins, University of Kansas
A Ram Kim, University of Kansas
Impact of an Authentic Environment on Learning of Math and Science
Prof. Chadia A. Aji, Tuskegee University
Prof. M. Javed Khan, Tuskegee University
Impact of Programming Robots and Drones on STEM Attitudes
Dr. M. Javed Khan, Tuskegee University
Prof. Chadia A. Aji, Tuskegee University
Development of a Virtual Reality Flight Simulator to Assist in the Design of Original Aircraft
Dr. Dominic M. Halsmer P.E., Oral Roberts University
Mr. John A. Voth, Oral Roberts University
Mr. Connor A. McCain, Oral Roberts University
Mr. Jordan David Reutter, Oral Roberts University
Nathaniel Shay Frailey
Matthew Samuelson
Mr. David Ahrens, Oral Roberts University

U402 - Architectural Division Technical Session
1:15 p.m. - 2:45 p.m., Room 151 A, Convention Center - Salt Palace
Sponsor: Architectural Engineering Division
Moderator: Nibert Saltibus, Sam Houston State University
Architectural Division Technical Session 3
Advancing Critical Building Code Education through Modularized Lectures
Dr. Ryan L. Solonsky P.E., Pennsylvania State University,
University Park
Current Trends in Architectural Engineering Education
Prof. John J. Phillips, Oklahoma State University
Teaching a Methodology towards a Sustainable, Affordable 3-D-printed House: Heat Transfer and Thermal-Stress Analysis
Dr. Ahmed Cherif Megri, North Carolina A&T State University

Mr. Ismail Megri
Dr. Sameer Hamoush P.E., North Carolina A&T State University

Dr. Taher M. Abu-Lebdeh
LEED® Lab™: Which Compliance Path is Best for Your University?
Mrs. Janet Fick, Ball State University
Dr. James W. Jones, Ball State University

U4104 - ET National Forum
1:15 p.m. - 2:45 p.m., Room 251 B, Convention Center - Salt Palace
Sponsors: Engineering Technology Council; Engineering Technology Division
ET National Forum meeting

U4109A - Sponsor Technical Session: How to Get Published in High-impact Journals and Promote Your Research—Presented by Elsevier
1:15 p.m. - 2:45 p.m., Room 150 B - Sponsor Tech Room, Convention Center - Salt Palace
Sponsor: Sponsored Sessions
Speakers:
Daniel Christe, Innovation Advisor at Elsevier
Rahul Malik, Assistant Scientific Editor at Cell Press
Elsevier is committed to supporting researchers in advancing their publishing careers. Researchers today need to be the ultimate multitaskers as they face increasingly complex challenges. With this workshop, Elsevier/Cell Press wants to give researchers the skills and knowledge they need to publish a world-class journal article, share their research data and promote their work, and ultimately succeed on their chosen career path. The program will focus on best practices and practical tools for success.

U4109B - Sponsor Technical Session: Beyond the LMS—Leveraging Modern Technology to Scale Learning and Drive Student Engagement - Presented By Campus Wire
1:15 p.m. - 2:45 p.m., Room 150 A - Sponsor Tech Room, Convention Center - Salt Palace
Sponsor: Sponsored Sessions
Speakers: Tade Oyerinde, Brian Smith, Gal Friedman
As university class sizes continue to grow and instructor/student ratios continue to decay, instructors are progressively facing new challenges scaling their core class processes. For example, how do instructors grade hundreds of students in a manner that is effective and personal, but also efficient? How do instructors conduct large classes whilst maintaining an environment in which students collaborate and make the personal connections that drive academic success? These challenges are increasingly explored in pedagogy research and teacher training, and a new generation of education technology tools are being invented to address them. This workshop brings together the leaders of Gradescope and Campuswire to discuss the latest research on the subject, exploring what works, what doesn’t, and where we go from here.

U411 - CEED Board Meeting
1:00 p.m. - 4:00 p.m., Room 250 A, Convention Center - Salt Palace
Sponsor: Cooperative and Experiential Education Division
This meeting is open to Cooperative & Experiential Education Division Board members only.
Free ticketed event

U4112A - Action on Diversity - Safe Zone Ally Training (Level 1)
1:15 p.m. - 2:45 p.m., Room 150 B - Sponsor Tech Room, Convention Center - Salt Palace
Sponsors: ASEE Diversity Committee; International Division; Minorities in Engineering Division
(Tickets are requested for planning purposes only! Please come even if you do not sign up in advance.)
Did you know…
• 1 in 3 LGBTQIA+ (lesbian, gay, bisexual, transgender, queer/questioning, intersex, asexual) students fear for their physical safety on college campuses?
• 1 in 3 LGBTQIA+ students are made to feel uncomfortable in our classrooms?
• LGBTQIA+ engineering students are more likely than women, underrepresented minorities, and non-LGBTQIA+ peers to report a chilly climate?
• STEM departments are lagging way behind other disciplines in the adoption of LGBTQIA+-inclusive practices?

You can help change this! Safe Zone Ally Training is a series of interactive workshops for students, faculty and the professional community during which participants will build the knowledge and skills needed to create a more inclusive and affirming environment for LGBTQIA+ individuals in engineering. The workshops have been developed by a community of Science and Engineering professionals and students, specifically for a STEM audience.

Safe Zone Level 1 focuses on understanding LGBTQIA+ concepts and the coming out process, responding to bias, and adopting simple strategies for building an inclusive environment.
Safe Zone Level 2 discusses aspects of engineering culture that act as barriers to LGBTQIA+ equality, explore heterosexual and cisgender privilege, and learn to recognize bias and disrupt discrimination.

The Deep Dive LGBTQIA+ Inclusion workshop focuses on creating a supportive and inclusive environment for transgender students and colleagues.
Participants in Levels 1 and 2 will receive a Safe Zone sticker to display in their workplace. Digital badges will be awarded for participation in each workshop in the Safe Zone series.

Free ticketed event
Sunday, June 24

**U4112B - Perspectives on Diversity, Equity, and Inclusion Beyond the Undergraduate Years**
1:15 p.m. - 2:45 p.m., Room 151 D, Convention Center - Salt Palace

*Sponsor:* ASEE Diversity Committee

*Moderator:* Ona Egbue, University of Minnesota Duluth

This session considers research and practical applications regarding diversity, equity, and inclusion in the engineering workforce. It includes academic, corporate, and professional organizational perspectives. Isolation, Microaggressions, and Racism: Black Engineers in Technology Companies

Miss Francesca Dupuy, University of Florida
Dr. Elliot P. Douglas, University of Florida
Paul G. Richardson, Independent Consultant/Engineer
Native Hawaiians in Engineering: A Path to the Professoriate
Dr. Thanh Truc Thi Nguyen, University of Hawai‘i at Mānoa
Dr. Oceana Puananilei Francis, University of Hawai‘i at Mānoa

Mānoa
Dr. Scott F. Miller, University of Hawai‘i at Mānoa
Donna Kaeau, University of Hawai‘i at Mānoa
Mr. Kapena McLean
Joshua Lelemia Irvine, University of Hawai‘i at Mānoa
Mr. Nicholas R. Izawa

The Career Pathways of Non-tenure-track Full-time Engineering Faculty
Mr. Cliff Fitzmorris, University of Oklahoma
Dr. Deborah A. Trytten, University of Oklahoma
Dr. Randa L. Shehab, University of Oklahoma

The American Society of Civil Engineers’ Canon 8: Codifying Diversity as Ethics
Dr. Canek Moises Luna Phillips, Rice University
Dr. Yvette E. Pearson P.E., Rice University
Dr. Lisa M. Black, American Society of Civil Engineers
Mr. Quincy G. Alexander, American Society of Civil Engineers

**U413A - Studies in Engineering Design**
1:15 p.m. - 2:45 p.m., Room 253 B, Convention Center - Salt Palace

*Sponsor:* Design in Engineering Education Division

An Experiential Learning Framework for Improving Engineering Design, Build, and Test Courses

Mr. Jackson Lyall Autrey, University of Oklahoma
Ms. Shalaka Subhash Ghasais, University of Oklahoma
Dr. Xun Ge, University of Oklahoma
Prof. Zahed Siddique, University of Oklahoma
Prof. Farrokh Mistree, University of Oklahoma

Methods to Study Elements of the Instructional Scaffolding Strategy Model for Enhancing Engineering Students’ Knowledge Construction in an Online Social Collaborative Learning Environment

Miss May-Ling Tan, Universiti Teknologi Malaysia
Dr. Jamalludin Harun, Universiti Teknologi Malaysia

Understanding Complexity: A Model for Characterizing a Sequence of Design Projects

Dr. Nicky Wolmarans, University of Cape Town

Dr. Jennifer M. Case, Virginia Tech

Quantifying Differences Between Professional Expert Engineers and Engineering Students Designing: Empirical Foundations for Improved Engineering Education

Prof. Kurt Henry Becker, Utah State University
Dr. John S. Gero, University of North Carolina, Charlotte
Dr. Morteza Pourmohamadi, Tabriz Islamic Art University
Sarah Abdellahi, University of North Carolina, Charlotte
Lilian Maria de Souza Almeida M.Sc., Utah State University
Mr. Yuzhen Luo, Utah State University

Neuro-cognitive Differences Among Engineering Students when Using Unstructured, Partially Structured, and Structured Design Concept Generation Techniques

Mo Hu, Virginia Tech
Dr. Tripp Shealy, Virginia Tech
Dr. John S. Gero, University of North Carolina, Charlotte

Mapping as Design Thinking: Can GIS Help Engineering Students Approach Design?

Ms. Jessie Marshall Zarazaga, Southern Methodist University, Lyle School of Engineering

**U413B - Understanding Student Development in Design**
1:15 p.m. - 2:45 p.m., Room 151 B, Convention Center - Salt Palace

*Sponsor:* Design in Engineering Education Division

Improving an online STEM Course through Quality Matters Certification - A Case Study

Dr. Hong Wang, University of Toledo

Integration of a Highway Fill Embankment Case Study in Engineering Design Courses for Instructional Improvement

Prof. Jiliang Li P.E., Purdue University Northwest
Prof. Nuri Zeytinoğlu P.E., Purdue University Northwest
Prof. Masoud Mojtahed, Purdue University Northwest
Mr. Matthew William Wooden, Purdue University Northwest
Mr. Ikechukwu Nnachi, Purdue University Northwest

Interdisciplinary Embedded Systems Design: Integrating Hardware-Oriented Embedded Systems Design with Software-Oriented Embedded Systems Development

Ms. Cynthia C. Fry, Baylor University
Mr. Steven Patrick Potter

Evaluation of Student Perceptions of Sustainability in Design: A Pilot Study

Dr. Andrew Joseph Bechtel, The College of New Jersey
Dr. Karen Chang Yan, The College of New Jersey

Engaging Students in Engineering Design through Low-vision Simulations

Miss Samantha Paige Moorzitz, The College of New Jersey
Prof. Manuel Alejandro Figueroa, The College of New Jersey

**U414A - Educational Research and Methods (ERM) Lunch with Champions**
1:15 p.m. - 2:45 p.m., Salon B, HQ Hotel - Marriott at City Creek

*Sponsor:* Educational Research and Methods Division

Schedule subject to change: Please go to [www.asee.org/icp](http://www.asee.org/icp) for up to date information
For new members to meet with established members.
Lunch buffet will be served.
Free ticketed event

**U414B - Practice I: Academic Success**
1:15 p.m. - 2:45 p.m., Room 254 A, Convention Center - Salt Palace
Sponsor: Educational Research and Methods Division
Moderators: Andrew Jackson, Purdue Polytechnic Institute; Jenna Carpenter, Campbell University
Educational Research and Methods Division Technical Session
A Cognitive Approach to Predicting Academic Success in Computing
Dr. Colby Goettel, Brigham Young University
Dr. Barry M. Lunt, Brigham Young University
A Systematic Literature Review on Improving Success of Women Engineering Students in the United States
Dr. Pradeep Kashinath Waychal, Western Michigan University
Dr. Charles Henderson, Western Michigan University
U4SE Computational Creativity: Improving Learning, Achievement, and Retention in Computer Science for CS and non-CS Undergraduates
Markeya S. Peteranetz, University of Nebraska, Lincoln
Dr. Duane F. Shell, University of Nebraska, Lincoln
Prof. Leen-Kiat Soh, University of Nebraska, Lincoln
Dr. Elizabeth Ingraham, University of Nebraska, Lincoln
Mr. Abraham Flanigan
Exploring Factors Influencing the Continued Interest in a Computer Science Major
Dr. Catherine T. Amelink, Virginia Tech
Ms. Kirsten Davis, Virginia Tech
Dr. Barbara G. Ryder, Virginia Tech
Ms. Margaret O’Neil Ellis, Virginia Tech
Rewards of an Engineering Prerequisite Assignment
Dr. Cynthia Jane Wilson Orndoff Esq., Florida Southwestern State College
Dr. Elizabeth W. Schott, Florida Southwestern State College
The Snowball Effect: Exploring the Influence of Changes in Academic Performance on Student Success in Co-enrolled Courses
Mr. Robert Matthew DeMonbrun, University of Michigan
Dr. Michael Geoffrey Brown, Iowa State University
Dr. Stephanie D. Teasley, University of Michigan
Characterizing Students’ Intercultural Competence Development Paths Through a Global Engineering Program
Ms. Kirsten Davis, Virginia Tech
Mr. David Reeping, Virginia Tech
Ms. Ashley R. Taylor, Virginia Tech
Dr. Cherie D. Edwards, Virginia Tech
Dr. Homero Gregorio Murzi, Virginia Tech
Dr. David B. Knight, Virginia Tech

**U421 - Engineering Libraries Division Technical Session 4**
1:15 p.m. - 2:45 p.m., Room 254 B, Convention Center - Salt Palace
Sponsor: Engineering Libraries Division
Moderator: Christa Spence, University of Toronto
Graduate Research Data Management Course Content:
- Teaching the Data Management Plan (DMP)
- Dr. Joseph H. Holles, University of Wyoming
- Mr. Larry Schmidt, University of Wyoming
- Work In Progress: A Snapshot of OER Adoption in Engineering Mechanics Courses
- Dr. Jacob Preston Moore, Pennsylvania State University, Mont Alto
- Dr. Thomas L. Reinsfelder, Pennsylvania State University, Mont Alto
- Teaching Research Data Management: It Takes a Team to Do It Right!
- Mr. Larry Schmidt, University of Wyoming
- Dr. Joseph H Holles, University of Wyoming
- Jamie M. Niehof, University of Michigan
- Lance Stuchell, University of Michigan
- Ms. Leena N. Lalwani, University of Michigan
- Mr. Paul F. Grochowski, University of Michigan

**U424 - Entrepreneurship & Engineering Innovation Division Technical Session 1**
1:15 p.m. - 2:45 p.m., Room 254 C, Convention Center - Salt Palace
Sponsor: Entrepreneurship & Engineering Innovation Division
Moderators: Noelle Comolli, Villanova University; Sandra Clavijo, Stevens Institute of Technology (School of Engineering and Science)
Integrated e-Learning Modules for Developing an Entrepreneurial Mindset: Direct Assessment of Student Learning
- Dr. Maria-Isabel Carnasciali, University of New Haven
- Dr. Ronald S. Harichandran, University of New Haven
- Dr. Nadiye O. Erdil, University of New Haven
- Dr. Jean Nocito-Gobel, University of New Haven
- Dr. Cheryl L. Li, University of New Haven
- Investigating the Entrepreneurial Mindset of Engineering and Computer Science Students
- Dr. Cheryl L. Li, University of New Haven
- Dr. Ronald S. Harichandran, University of New Haven
- Dr. Nadiye O. Erdil, University of New Haven
- Dr. Jean Nocito-Gobel, University of New Haven
- Dr. Maria-Isabel Carnasciali, University of New Haven
- Developing an Entrepreneurial Mindset Using the KEEN Framework for a Digital Communication System Course
- Prof. John M. Santiago Jr., Colorado Technical University
- Dr. Jing Guo, Colorado Technical University
- Developing the Entrepreneurial Self: Integrating Professional Growth in an Engineering Design and Entrepreneurship Course

Schedule subject to change: Please go to www.asee.org/icp for up to date information.
Conference Sessions

Sunday, June 24

A Successful Pre-college Nanotechnology Experience for Low-income Students (Evaluation)
Dr. Cristina D. Pomales-Garcia, University of Puerto Rico, Mayaguez Campus
Prof. Oscar Marcelo Suarez, University of Puerto Rico, Mayaguez Campus
Dr. Agnes M. Padovani, University of Puerto Rico, Mayaguez Campus
Prof. Jaqueline Ester Alvarez, University of Puerto Rico, Mayaguez Campus

Improving Spatial Visualization Abilities Using 3D Printed Blocks
Mrs. Vanessa LeBow, University of Arkansas
Dr. Michelle L. Bernhardt-Barry, University of Arkansas
Dr. Jyotishka Datta, University of Arkansas
The Effect of the Project Lead the Way Program on Students' Spatial Visualization Skills (Evaluation)
Mrs. Jamie R. Gurganus, University of Maryland, Baltimore County
Miss Elyse Hill, University of Guelph
Dr. Anne Marie Spence, Baylor University

U427 - First-Year Programs Division Officers Meeting
1:15 p.m. - 2:45 p.m., Room 250 B, Convention Center - Salt Palace
Sponsor: First-Year Programs Division
A convening of the Officers of the First-Year Programs Division to conduct business. By invitation.

U429 - IED Technical Session: Preparing Programs for the Future
1:15 p.m. - 2:45 p.m., Room 255 F, Convention Center - Salt Palace
Sponsor: Industrial Engineering Division
Moderator: Gene Dixon, East Carolina University

A New Industrial and Systems Engineering Program: Benchmarking Results to Determine What and Why
Dr. Kate D. Abel, Stevens Institute of Technology
A Systems Approach to Accredited Program Accountability in Regional Universities
Dr. David Elizandro, Tennessee Technological University
Dr. David H. Huddleston, Tennessee Technological University
Mr. Angela A. Volpe, Tennessee Technological University
Industrial Engineering Outreach to K-12 Community
Mr. Anuj Mittal, Iowa State University
Prof. Sriram Sundararajan, Iowa State University
Dr. D. Raj Raman, Iowa State University
Dr. Caroline C. Krejci, University of Texas at Arlington
Curriculum and Specializations Framework to Address Skills Required by Manufacturing Companies
Dr. Naheel Yousef, Daytona State College
Dr. Ron Eaglin, Daytona State College
Detecting Current Job Market Skills and Requirements Through Text Mining
Prof. Houshang Darabi, University of Illinois, Chicago
Mr. Fazle Shahnawaz Muhibul Karim, University of Illinois, Chicago
Samuel Thomas Harford
Ms. Elnaz Douzali, University of Illinois, Chicago
Dr. Peter C. Nelson, University of Illinois, Chicago

U433A - PCEE Evaluation Studies
1:15 p.m. - 2:45 p.m., Room 255 A, Convention Center - Salt Palace
Sponsor: Pre-College Engineering Education Division
Moderator: Emilie Siverling, Purdue University-Main Campus, West Lafayette (College of Engineering)
Learn about evaluation studies in pre-college engineering education.

U433B - Professional Development for Teachers and Counselors
1:15 p.m. - 2:45 p.m., Room 255 C, Convention Center - Salt Palace
Sponsor: Pre-College Engineering Education Division
Moderator: Shelly Tornquist, Texas A&M University
Topics include guidance counselor PD, longitudinal evaluation of PD, and summer teacher PD.
'Helped Me Feel Relevant Again in the Classroom': Longitudinal Evaluation of a Research Experience for a Teachers' Program in Neural Engineering (Evaluation)
Ms. Kristen Clapper Bergsman, University of Washington
Ms. Jill Lynn Weber, Center for Research and Learning
Dr. Eric H. Chudler, University of Washington
A Study of the Attitudes and Practices of K-12 Classroom Teachers who Participated in Engineering Summer Camps (Evaluation)
Dr. Amber L. M. Kendall, North Carolina State University
Dr. Laura Bottomley, North Carolina State University
Mrs. Susan Beth D'Amico, North Carolina State University Professional Development for High School Guidance Counselors to Facilitate Pre-college STEM Preparation (RTP)
Richard A. Gearns, Stony Brook University
Dr. Angela M. Kelly, Stony Brook University
Dr. Monica Bugallo, Stony Brook University

U434A - Learning How to be Socially Responsible Engineers – A Comparison of Methods and Lessons Learned
1:15 p.m. - 2:45 p.m., Room 151 F, Convention Center - Salt Palace
Sponsor: Liberal Education/Engineering & Society Division
Speakers: Dr. Juan C. Lucena, Colorado School of Mines; Dr. Nathan E Canney P.E.; Dr. Angela R Bielefeldt P.E., University of Colorado, Boulder; Dr. James L. Huff, Harding University

Schedule subject to change: Please go to www.asee.org/icp for up to date information
Conference Sessions

Joint Session with Liberal Education/Engineering Studies, Community Engagement, and Ethics
As engineering students go through college and transition into the workforce, they assume significant responsibility for individuals and society based on their decisions. Problematically, multiple recent studies have shown that as they progress through college, many students become less engaged in the societal implications of their work, and their sense of social responsibility decreases [1]–[3]. Therefore, we recognize the imperative of providing time and space for students to learn and engage with their future social responsibilities as engineers. Within ASEE, we have decades of experience teaching and researching about ethics, social responsibility, and social justice in engineering. Our students will face many more complex challenges in the future, and we feel it is time to have a conversation about best practices for various educational environments. In this panel session, four faculty members who have significant experience teaching in this space at their various universities will share their methods to facilitate learning about social responsibility. They will have stories to tell about trying to integrate ethics into their core engineering courses, collaborating with community members in service-learning projects, teaching a course focused entirely on engineering for social and environmental responsibility, and delivering an engineering for social justice class. We also aim to have a variety of engineering disciplines and university contexts represented. Our goals for this panel are to provide a spectrum of options for teaching social responsibility. New or experienced faculty who are interested, but have little experience, will find value, as well as those who are looking for new ways for their students to wrestle with complex justice issues. We also intend to leave at least 30 minutes for discussion and sharing of experiences from other faculty in the session.

U434B - Diversity and Inclusion: Concepts, Mental Models, and Interventions
1:15 p.m. - 2:45 p.m., Room 151 C, Convention Center - Salt Palace
Sponsor: Liberal Education/Engineering & Society Division
Moderator: Kathryn Neeley, University of Virginia

Dimensions of Diversity in Engineering: What We Can Learn from STS
Dr. Toluwalogo Odomosu, University of Virginia
Dr. Sean Ferguson, University of Virginia
Dr. Rider W. Foley, University of Virginia
Dr. Kathryn A. Neeley, University of Virginia
Dr. Caitlin Donahue Wylie, University of Virginia
Dr. Sharon Tsai-hsuan Ku, University of Virginia
Prof. Rosalyw M. Berne, University of Virginia

Diversity and Inclusion in Engineering: Students’ Perceptions of Learning and Engaging with Difference
Mr. Sean M. Eddington, Purdue University, West Lafayette
Dr. Carla B. Zołtowski, Purdue University, West Lafayette
Dr. Andrew O. Brightman, Purdue University, West Lafayette
Dr. Rucha Joshi, Purdue University, West Lafayette
Prof. Patrice Marie Buzzanell, Purdue University, West Lafayette

David Torres, Purdue University, West Lafayette

U445A - Energy Innovation and Environmental Impact
1:15 p.m. - 2:45 p.m., Room 150 D, Convention Center - Salt Palace
Sponsors: Engineering Physics and Physics Division; Energy Conversion and Conservation Division; Environmental Engineering Division; Mechanics Division
Moderator: Genaro Zavala, Tecnologico de Monterrey, Monterrey, Mexico and Universidad Andres Bello, Santiago, Chile
Speakers: Dr. Ramanitharan Kandiah P.E., Central State University; Dr. Tooran Emami, U.S. Coast Guard Academy; Dr. Bala Maheswaran, Northeastern University; Dr. Veera Ganeswar Gude P.E., Mississippi State University

This session provides the current trend in Energy System Innovation and the Environment-related issues, and covers the following:
- The Energy System Innovation education in engineering programs
- Engineering and Physics related activities for understanding of Energy System Innovation
- Environmental Issues in implementing the Innovative Energy System
Conference Sessions

Sunday, June 24

- Involvement of Engineering and Physics undergraduates/graduates in the Energy Innovation field
- Energy System Innovation impact on future Energy requirements.

U445B - Engineering Physics and Physics Division Technical Session 3
1:15 p.m. - 2:45 p.m., Room 151 E, Convention Center - Salt Palace
Sponsor: Engineering Physics and Physics Division
Moderators: Inci Ruzybayev, York College of Pennsylvania; Yumin Zhang, Southeast Missouri State University

Engineering Physics and Physics Division Technical Session
A Size and Scale Laboratory Experiment for Introductory Nanotechnology
Scott Alexander Kaiser, Utah Valley University
Dr. Reza Kamali, Utah Valley University
Dr. Paul Weber, Utah Valley University
Dr. Afshaneh Minaei, Utah Valley University

Towards a Full Integration of Physics and Math Concepts: The Path Full of Traps
Prof. Angeles Dominguez, Tecnologico de Monterrey (ITESM) and Universidad Andres Bello (UNAB)
Itzel Hernandez-Armenta, Tecnologico de Monterrey
Dr. Jorge Eugenio de la Garza Becerra, Tecnologico de Monterrey (ITESM)

Voices of the Millennial Generation: Connections Between Physics, Scientific Literacy and Attitudes towards Future Space Exploration
Ms. Danielle Roslyn Montecalvo, American University
Dr. Teresa L. Larkin, American University

Curricula
1:15 p.m. - 2:45 p.m., Room 151 G, Convention Center - Salt Palace
Sponsor: Community Engagement Division
Moderator: Malini Natarajarathinam, Texas A&M University

“Engagement in Practice” sessions include short presentations of each paper (3-5 minutes) with ample time remaining for facilitated discussion and sharing by presenters and members of the audience. Papers in this session are focused on providing descriptive detail of specific community engagement endeavors.

Engagement in Practice: Using Community Engagement to Teach Drafting Software to Civil Engineering Students
Dr. Nathan E Canney P.E., Elizabeth O’Brien, Seattle University
Teddi Callahan,

Engagement in Practice: Academic Service in a Sophomore-level Mechanical Engineering Measurements Lab
Dr. Ines Basalo, University of Miami
Dr. Jonathon Anthony Toft-Nielsen, University of Miami
Dr. Scottney D. Evans, University of Miami

Engagement in Practice: CAE Education via Service-Learning
Dr. David C. Che, Mount Vernon Nazarene University

Engagement in Practice: Engaging Undergraduate Students in a Multidisciplinary Service-Learning Environment
Dr. Wei Lu, Texas A&M University
Dr. Malini Natarajarathinam, Texas A&M University
Dr. Mary E. Campbell, Texas A&M University
Mary K. McDougal, Texas A&M University
Ms. Lauren Neala Holder, Texas A&M University

Engagement in Practice: Engineering for Social Change Course in Mechanical Engineering
Dr. Maria C. Sanchez, University of Maryland College Park
Mr. Dylan Anthony Hazelwood, University of Maryland, College Park

Engagement in Practice: Teaching Introductory Computer Programming at County Jails
Dr. Theresa Anne Migler-VonDollen, California Polytechnic State University, San Luis Obispo
Dr. Lizabeth T Schlemer, California Polytechnic State University, San Luis Obispo

U448 - Systems Engineering Division Technical Session 1: Course Design & SE Competencies
1:15 p.m. - 2:45 p.m., Room 150 F, Convention Center - Salt Palace
Sponsor: Systems Engineering Division
Moderator: Rachana Gupta, North Carolina State University

Design and Development of an Auto-fetch Dog System Using a System Engineering Approach in an Electrical Engineering Master’s Capstone Course
Prof. John M. Santiago Jr., Colorado Technical University
Dr. Jing Guo, Colorado Technical University

From Technology Elaboration Toward Application Innovation: An Instructional Transformation in a Project-oriented Capstone Course of Dynamic Control Systems
Mr. Kuan-Yu Chou, National Chiao Tung University
Prof. Yon-Ping Chen, National Chiao Tung University
Prof. Sunny S. J. Lin, National Chiao Tung University
Dr. Chao-Yang Cheng, National Chiao Tung University

A Four-step Method for Capstone Design Teams to Gather Relevant and Well-defined Product Requirements
Dr. Raksha Ashok Gupta, North Carolina State University
Mr. Greg A. Dunko, NantHealth

U452 - Engagement in Practice: Integrating Community Engagement into Engineering

Schedule subject to change: Please go to www.asee.org/icp for up to date information
Creating and Scaling an Evidence-based Faculty Development Program
Dr. Casey Jane Ankeny, Northwestern University
Mrs. Lindy Hamilton Mayled, Arizona State University
Lydia Ross, Arizona State University
Dr. Keith D. Hjelmdad, Arizona State University
Prof. Stephen J. Krause, Arizona State University
Prof. James A. Middleton, Arizona State University
Prof. Robert J. Culbertson, Arizona State University
Prof. Stephen J. Krause, Arizona State University
Dr. Ying-Chih Chen, Arizona State University

Increasing Student Engagement in Engineering Through Transformative Practices
Dr. Vittorio Marone, University of Texas, San Antonio
Mrs. Robin L. Nelson, University of Texas, San Antonio
Ms. Stephanie Ann Garcia, University of Texas at San Antonio
Dr. Emily Peterek Bonner, University of Texas, San Antonio
Dr. Timothy Yuen, University of Texas, San Antonio
Dr. JoAnn Browning P.E., University of Texas, San Antonio

Review Procore functionality, educational offerings, and how technology is impacting the classroom. We will be focusing on common tools used by our recent graduates and how to leverage your certifications and training to future employers. We will also highlight the sample project data and classroom-ready curricula files for professors. Procore Construction OS connects people, applications, and devices through a unified platform that helps construction firms manage risk and build quality projects safely, on-time, and within budget. Headquartered in Carpinteria, California, with offices around the globe, Procore has more than 2.5 million users managing billions of dollars in annual construction volume.

Moderator: Miles Anderson, Procore
Miles Anderson empowers communities by providing them free access to industry-leading technology to support their classrooms and nonprofit projects. After graduating from UC Santa Barbara with a B.A. in political science, he joined Procore Technologies and learned about the landscape of technology in the AEC industry working in business development. He is now a senior member of the Procore.org team and supports universities, K-12 programs, union training centers, associations, and nonprofit builders that have needs for technology as a social impact strategic advisor.

U5104 - ETLI Planning Meeting
3:00 p.m. - 4:30 p.m., Room 251 B - Convention Center - Salt Palace
Sponsors: Engineering Technology Council; Engineering Technology Division
ET Leaders Institute planning meeting

Join Texas A&M University for a presentation and demo of their DSTR platform for teaching higher ed robotics. This unique design will be a great addition as a platform to any robotics or mechatronics course and student activities.

Presenters: Dr. Joseph A. Morgan, Texas A&M; Mark Easley, Texas Instruments
Snacks will be provided.

U5112A - Expanding Diversity, Equity, and Inclusion in Engineering Cultures from a Theoretical Perspective
2:45 p.m. - 4:30 p.m., Room 151 A - Convention Center - Salt Palace
Sponsor: ASEE Diversity Committee
Moderator: Jennifer Karlin, Minnesota State University, Mankato
The papers in this session expand and critique theories supporting diversity, equity, and inclusion in engineering educational cultures.

Translating Theory on Color-blind Racism to an Engineering Education Context: Illustrations from the Field of Engineering Education
Dr. Alice L. Pawley, Purdue University, West Lafayette

Schedule subject to change: Please go to www.asee.org/icp for up to date information
Sunday, June 24

**Conference Sessions**

**U5116 - ABET SESSION: Listening Session—Academic Advisory Council—NEW!!**
3:00 p.m. - 4:45 p.m., Room 150 D, Convention Center - Salt Palace

**Sponsor: ABET Sponsored Sessions**
Are you aware that ABET has an Academic Advisory Council (AAC)? Did you know that the AAC represents all four ABET commissions? Provosts, deans, and chairs from a variety of institutions across the U.S. populate the AAC. It is one of three councils that provide recommendations to the ABET board of directors on issues of importance, particularly to the academic community. This listening session will highlight the impactful work of the AAC, review its current initiatives, and invite you to present topics and issues for the AAC to consider working on to make meaningful and helpful changes to the ABET processes and practices.

**U513 - Making, Hacking, and Extracurricular Design**
3:00 p.m. - 4:30 p.m., Room 253 A, Convention Center - Salt Palace

**Sponsor: Design in Engineering Education Division**
Transformation of Design Instruction in a Low-Resource Setting
Matthew Petney, Rice 360 Institute for Global Health
Mr. Samuel Gonthako Ng’anjo, University of Malawi, The Polytechnic
Mr. Joseph Chikaphonya Phiri, University of Malawi, The Polytechnic
Dr. Matthew Wettergreen, Rice University
Dr. Ann Saterbak, Duke University
Investigating Why Students Choose to Become Involved in a University Makerspace through a Mixed-methods Study
Mr. Ethan Hilton, Georgia Institute of Technology

**U521 - Engineering Libraries Division Technical Session 2**
3:00 p.m. - 4:30 p.m., Room 252, Convention Center - Salt Palace

**Sponsor: Engineering Libraries Division**
Moderator: Patricia Watkins, Embry-Riddle Aeronautical University, Prescott

Reinforcing Information Fluency: Instruction Collaboration in Senior Capstone Laboratory Course
Dr. William W. Tsai, California State University, Maritime Academy
Amber Janssen MLIS, California State University, Maritime Academy

Innovative Uses of Social Media in Information Literacy Education, Library Outreach, and User Engagement: An International Perspective
Ms. Qing Li, IEEE

Using a Flipped Lesson to Improve Information Literacy Outcomes in a First-year Design Class
Brianna B. Buljung, Colorado School of Mines
Leslie Light, Colorado School of Mines

Understanding the Significance of Integrating Codes and Standards into the Learning Environment
Prof. Virginia Charter P.E., Oklahoma State University
Dr. Bryan Lawrence Hoskins, Oklahoma State University
Samuel B. Montgomery, Oklahoma State University

Schedule subject to change: Please go to www.asee.org/icp for up to date information
Conference Sessions

Sunday, June 24

**U523 - ET Pedagogy I**
3:00 p.m. - 4:30 p.m., Room 150 G, Convention Center - Salt Palace
Sponsor: Engineering Technology Division
Moderators: Ken Rennels, Indiana University Purdue University, Indianapolis; Irina Ciobanescu Husanu, Drexel University (Tech.)

Engineering Technology Division technical session.
A Learning-centered Educational Paradigm: Case Study on Engineering Technology Students’ Design, Problem-solving, Communication, and Group Skills
Dr. Rustin Webster, Purdue University, New Albany
Integrating Statistical Methods in Engineering Technology
Dr. Sanjeevi Chitikeshi, Old Dominion University
Jake Hildebrant, Murray State University
Dr. Otilia Popescu, Old Dominion University
Dr. Orlando M. Ayala, Old Dominion University
Dr. Vukica M. Jovanovic, Old Dominion University
An Engineering Technology Course in Additive Manufacturing
Prof. Christopher David LeBlanc, University of New Hampshire
Dr. Donald J. Plante, University of New Hampshire
Identifying Classroom Management Strategies by Focusing on Diversity and Inclusion
Dr. Mohammad Moin Uddin P.E., East Tennessee State University
Dr. Keith V. Johnson, East Tennessee State University

**U524 - Entrepreneurship & Engineering Innovation Division Technical Session 2**
3:00 p.m. - 4:30 p.m., Room 254 C, Convention Center - Salt Palace
Sponsor: Entrepreneurship & Engineering Innovation Division
Moderators: Sandra Clavijo, Stevens Institute of Technology (School of Engineering and Science); Pritpal Singh, Villanova University
The Entrepreneurial Engineer: A Quantitative Analysis of Personality Factors in the Social Cognitive Career Theory
Leon Szel, Stanford University
Dr. Shannon Katherine Gilmartin, Stanford University
Dr. Helen L. Chen, Stanford University
Dr. Sheri Sheppard, Stanford University
The T-Shaped Engineer as an Ideal in Technology Entrepreneurship: Its Origins, History, and Significance for Engineering Education
Dr. Kathryn A. Neeley, University of Virginia
Prof. Bernd Steffensen, University of Applied Sciences Darmstadt
‘Is Someone in Your Family an Entrepreneur?’: Examining the Influence of Family Role Models on Students’ Entrepreneurial Self-efficacy and its Variation Across Gender
Dr. Prateek Shekhar, University of Michigan
Dr. Aileen Huang-Saad, University of Michigan
Prof. Julie Libarkin,
Miss Anastasia Katharine Ostrowski, University of Michigan
Curious About Student Curiosity: Implications of Pedagogical Approach for Students’ Mindset
Dr. Margot A. Vigeant, Bucknell University
Prof. Charles Kim, Bucknell University
Dr. Michael J. Prince, Bucknell University
Dr. Katharyn E. K. Notis, Bucknell University
Dr. Amy Frances Golightly, Bucknell University
Entrepreneurial Mindset (EM) Modules for Chemical Engineering Courses
Dr. Noelle K. Comolli, Villanova University
Dr. Jacob James Elmer, Villanova University

**U526 - Influential Considerations in the Design and the Running of Engineering Laboratories**
3:00 p.m. - 4:30 p.m., Room 150 F, Convention Center - Salt Palace
Sponsors: Experimentation and Laboratory-Oriented Studies Division; New Engineering Educators Division
Moderator: Bijan Sepahpour, The College of New Jersey
The experienced members of the panel have diverse backgrounds and will discuss the significance of the proper planning and impact of the following influential parameters in the design and running of laboratories:
1. Availability of space
2. Faculty and staff with the necessary backgrounds
3. Prioritized program needs
4. Availability of the necessary minimum budget
5. Choice(s) of equipment
6. Duration/run time of the laboratory
7. Safety
8. Maintenance
9. Accommodations for students with disabilities
10. Time of course offerings
Panel members: Lisa Grega (committed), Mac Haas, Nebojsa Jaksic (committed), Lisa Huettel, Hakan Gurocak, Wayne Whitman, Joseph Rencis, and Bijan Sepahpour (committed)

**U530 - Computing Research**
3:00 p.m. - 4:30 p.m., Room 150 E, Convention Center - Salt Palace
Sponsor: Computing and Information Technology Division
Moderators: Deng Cao, Central State University; Mudasser Wyne, National University
The Research Experience for Undergraduates (REU) Principal Investigators (PI) Guide: Development of a Best Practices Website
Ms. Mariangely Iglesias Pena, Iowa State University
Prof. Stephen B. Gilbert, Iowa State University
Jamie Payton, Temple University
Undergraduate Research: Introducing Deep Learning-based Image Classification to Undergraduate Students
Dr. Deng Cao, Central State University
Dr. Cadance Lowell, Central State University
Dr. Augustus Morris, Central State University

Schedule subject to change: Please go to www.asee.org/icp for up to date information
**U533A - PCEE Biomedical Engineering**
3:00 p.m. - 4:30 p.m., Room 255 A, Convention Center - Salt Palace
Sponsor: Pre-College Engineering Education Division
The intersection of biomedical engineering and pre-college engineering education is the focus of this session.
IBBME Discovery: Biomedical Engineering-based Iterative Learning in a High School STEM Curriculum (Evaluation)
Mr. Locke Davenport Huyer, University of Toronto
Neal I. Callaghan, University of Toronto
Rami Saab, University of Toronto
Daniel Smieja, University of Toronto
Mr. Andrew Effat,
Dr. Dawn M. Kilkenny, University of Toronto
Individual- and group-level effects on learning during engineering design tasks in high school biology (Fundamental).
Dr. Martina Nieszwandt, University of Massachusetts, Amherst
Dr. Elizabeth McEneaney, University of Massachusetts, Amherst
NeuroBytes: Development of an Integrative Educational Module Across Neurophysiology and Engineering (Evaluation)
Ms. Isabel Maria Gossler, University of Arizona
Dr. Vignesh Subbian, University of Arizona
Ms. J. Jill Rogers, University of Arizona
Teaching Fundamentals in Lasers and Light Technology to Advanced Applied Optics in Biology and Biomedical Research: Analyzing the Team-teaching Influence on High School Students’ Perception of and Confidence in STEM
Ms. Vahideh Abdolazimi, Drexel University
Mr. Jared Andrew Ruddick, School District of Philadelphia
Jessica S. Ward, Drexel University
Dr. Adam K. Fontecchio, Drexel University
Mr. Richard Edward Giduck, Drexel University

**U533B - Teacher Attitudes, Beliefs, and Self-efficacy**
3:00 p.m. - 4:30 p.m., Room 255 C, Convention Center - Salt Palace
Sponsor: Pre-College Engineering Education Division
Moderator: Stacy Klein-Gardner, Vanderbilt University
Delve into studies on teacher attitudes and beliefs in this session.
Assessing High School Science Teachers’ Nature of Engineering (NOE) Perceptions with an Open-ended NOE Instrument (Fundamental)
Dr. Erica J. Marti, University of Nevada, Las Vegas
Mr. Erdogan Kaya, University of Nevada, Las Vegas
Dr. Hasan Deniz, University of Nevada, Las Vegas
Miss Jessica Lauren Sargent, Purdue University, West Lafayette
K-5 Teachers’ Perceptions of Engineering Education and Perceived Barriers to Teaching Engineering
Dr. Rebekah J. Hammack, Albert Einstein Distinguished Educator Fellowship Program

**U534A - Communicating Across Cultural and Epistemological Boundaries**
3:00 p.m. - 4:30 p.m., Room 151 F, Convention Center - Salt Palace
Sponsor: Liberal Education/Engineering & Society Division
Moderator: Judith Norback, Georgia Institute of Technology
Engineering/Design Frictions: Exploring Competing Knowledge Systems via Efforts to Integrate Design Principles into Engineering Education
Dr. Dean Nieuwma, Rensselaer Polytechnic Institute
From ‘Empathic Design’ to ‘Empathic Engineering’: Toward a Genealogy of Empathy in Engineering Education
Dr. Xiaofeng Tang, Ohio State University
Where’s My Code? Engineers Navigating Ethical Issues on an Uneven Terrain
Dr. Cindy Rottmann, University of Toronto
Dr. Doug Reeve, University of Toronto
Dr. Robin Sacks, University of Toronto
Mr. Mike Klassen, University of Toronto
Reimagining Energy: Deconstructing Traditional Engineering Silos Using Culturally Sustaining Pedagogies
Dr. Gordon D. Hoople, University of San Diego
Dr. Joel Alejandro Mejia, University of San Diego
Dr. Diana A. Chen, University of San Diego
Dr. Susan M. Lord, University of San Diego

**U534B - Design, Assessment, and Redesign of Writing Instruction for Engineers**
3:00 p.m. - 4:30 p.m., Room 151 G, Convention Center - Salt Palace
Sponsor: Liberal Education/Engineering & Society Division
Moderator: Deanna Matthews, Carnegie Mellon University
Examining engineering writing instruction at a large research university through the lens of writing studies
John Y. Yoritomo, University of Illinois at Urbana-Champaign
Nicole Turnipseed, University of Illinois at Urbana-Champaign
Prof. S. Lance Cooper, University of Illinois at Urbana-Champaign
Celia Mathews Elliott, University of Illinois at Urbana-Champaign
Dr. John R. Gallagher, University of Illinois at Urbana-Champaign
Prof. John S. Popovics, University of Illinois at Urbana-Champaign
Prof. Paul Prior, University of Illinois at Urbana-Champaign
Julie L Zilles, University of Illinois Urbana Champaign

Schedule subject to change: Please go to www.asee.org/icp for up to date information
Conference Sessions

Satisfaction: Intrinsic and Extrinsic Motivation in Engineering Writing Coursework
Dr. Stephanie Pulford, University of California, Davis
Jiahui Tan, University of California, Davis
Michael Raymond Gonzalez, University of California, Davis
Ms. Amanda Modell, University of California, Davis
Beyond Drag and Drop: Balancing Experience and Innovation in Online Technical Communication Course Development
Jessica Livingston, Rose-Hulman Institute of Technology
Dr. Sarah Summers, Rose-Hulman Institute of Technology
Mary Jane Szabo, Rose-Hulman Institute of Technology
Technical Communication Across the ME Curriculum at Rose-Hulman
Dr. Rebecca Bercich, Rose-Hulman Institute of Technology
Dr. Sarah Summers, Rose-Hulman Institute of Technology
Dr. Phillip Cornwell, Rose-Hulman Institute of Technology
James Mayhew, Rose-Hulman Institute of Technology

U548 - Systems Engineering Division Technical Session 2: SE Applications
3:00 p.m. - 4:30 p.m., Room 151 B, Convention Center - Salt Palace
Sponsor: Systems Engineering Division
Moderator: William Miller, Stevens Institute of Technology (School of Engineering and Science)

Application of DEJI® Systems Engineering Model in the Development of a New Faculty Mentoring Program in Higher Education
Dr. Sharon Claxton Bommer, KBRwyle
Dr. Alice E. Grimes, Air Force Institute of Technology
Prof. Adele DeJi B. Badiru, Air Force Institute of Technology
Mission Engineering Competencies
Ms. Nicole A.C. Hutchison, Stevens Institute of Technology
Sergio Luna, Stevens Institute of Technology
Mr. William D. Miller, Stevens Institute of Technology
Dr. Hoong Yan See Tao, Stevens Institute of Technology
Dr. Dinesh Verma, Stevens Institute of Technology
Prof. Greg T. Vesonder, Stevens Institute of Technology
Prof. Jon Patrick Wade, Stevens Institute of Technology

U596A - Engineering and Engineering Technology Chairs Open Exchange
3:00 p.m. - 4:15 p.m., Salon J, HQ Hotel - Marriott at City Creek
Sponsor: ASEE Headquarters
This 90-minute session offers an opportunity for engineering and engineering technology chairs and department heads to have open discussions, exchange ideas, talk through challenges, and build working relationships. The session will be a combination of structured and unstructured discussions. This session is only open to engineering and engineering technology chairs and department heads.

Challenging Scenarios Discussion: The majority of the session will revolve around a "challenging scenarios" exercise, where real scenarios that chairs have experienced will be discussed and considered by those in attendance. You can share your scenario anonymously here: https://www.surveymonkey.com/r/3WYXBXV
Free ticketed event

U596B - ASEE Data Collection Meeting
3:00 p.m. - 4:30 p.m., Room 250 C, Convention Center - Salt Palace
Sponsor: ASEE Headquarters
ASEE data collection meeting.

U596C - ASEE Editorial Board Meeting
3:00 p.m. - 4:30 p.m., Room 250 F, Convention Center - Salt Palace
Sponsor: ASEE Headquarters
ASEE editorial board meeting.

U696 - ASEE Division Mixer Sponsored by University of Utah
4:30 p.m. - 6:00 p.m., Grand Ballroom A-H, Convention Center - Salt Palace
Sponsor: ASEE Headquarters
One of our most popular events! The Division Mixer kicks off the conference with music, drinks, food, and colleagues. This event is both a networking opportunity and a chance for divisions to showcase and promote themselves to prospective members. Tables staffed by participating divisions may feature contests and prize giveaways. This event is complimentary for all attendees.

U7101 - PNW Section Mixer
7:30 p.m. - 9:30 p.m., Offsite, Whiskey Street, 323 Main St. Salt Lake City, Utah
Sponsor: Council of Sections
Please join your colleagues for the 10th Annual Pacific Northwest Section Mixer. This ever-popular event includes food, drinks, and fun with your Pacific Northwest colleagues. Many people have commented that this is one of the best events at the conference. Please add it to your itinerary. We look forward to seeing you there!
Ticketed event: Member Tickets - $10.00 advanced registration and $20.00 on site registration
Student Tickets - $5.00 advanced registration and $5.00 on site registration

U7109 - New This Year! Texas Instruments Robotics Pavilion
6:00 p.m. - 7:30 p.m., Exhibit Hall A B & C, Convention Center - Salt Palace
Sponsor: Sponsored Sessions
Check out TI's robotics pavilion #1031 for live robotics demos and challenges!
Sunday, Jun 25th: DSTR Robot from 6 - 7:30p.m.
Monday, June 26th: TI-RSLK from 5-6p.m.
Tuesday, June 27th: TI-Innovator™ Rover from 11:30a.m. – 1p.m.

U796 - Back by Popular Demand! Virtual Reality Experience
6:00 p.m. - 7:30 p.m., Exhibit Hall A B & C, Convention Center - Salt Palace
Sponsor: ASEE Headquarters
Get immersed in the latest Virtual Reality experience - located in the back of the Exhibit Hall.
myVRadventure was created with the goal of sharing interactive STEM-based activities and emerging technologies with as many impressionable and curious minds as possible.

Through our customizable services, we deliver an out-of-this-world, engaging experience, which brings people together using a unique blend of education, science, and entertainment.

At the 2018 ASEE conference, myVRadventure will be providing 4 Room-Scale VR Stations and 4 Seated VR Stations, allowing participants to choose among several different virtual experiences, including:

- The LAB – Curated, Interactive VR Experience
- Rec Room – Multiplayer, Interactive Questing and Exciting Team Building Adventure
- FORM – Mind Bending experience where the puzzles are built from dreams and ancient memories
- The Body VR: Journey Inside a Cell - An educational virtual reality experience that takes the user inside the human body for a tour of organs, vessels, cells and more
- Escape Room - Players are prompted to solve a series of challenging puzzles to escape from their office before a microchip in their head explodes.
- Apollo 11 VR – This is the story of the greatest journey ever taken by humankind. This VR experience is a recreation of the events which took place between July 16th and July 24th, 1969.
- Fantastic Contraption – A surreal, physics-based, building and engineering game for VR. Inside the game you must create life-sized contraptions to solve puzzles on the other side of an island.
- Tilt Brush – Write, draw, and create complex paintings in Virtual Reality. Perfect for Artists and creative minds alike
- Job Simulator - Take instructions from your robot masters in the experience that allows you to become a Chef, Auto Mechanic, Store Clerk or Office Worker. Extremely Funny
- The Blu – Interactive Underwater Tour. Experience the wonder and majesty of the ocean through a series of habitats and come face to face with some of the most awe-inspiring species on the planet.
- Google Spotlight Stories - Choice of short virtual animated shorts, Including: Pearl, Special Delivery, Rain or Shine, Sonaria, Son of Jaguar. Fun and engaging for all ages
- And more to come…

(Each experience has been selected for its educational, entertainment value and length - keeping in mind that the time per experience per participant may be limited, depending on demand.)

Event: Sunday 6/24/2018  Live demo - Reception 6 p.m.
Event Monday 6/25/2018  8 a.m. – 5 p.m.
Event Tuesday 6/26/2018  8 a.m. – 5 p.m.

**U799 - Campus Rep Reception**

7:30 p.m. - 9:00 p.m., Salon D, HQ Hotel - Marriott at City Creek

**Sponsor: Campus Representatives**
The annual campus reps reception to honor the 2017-2018 Spread the Word recruitment campaign winners.

Free ticketed event
**Monday, June 25**

**Conference Sessions**

**M196C - ASEE Registration Open**
7:00 a.m. - 5:00 p.m., Exhibit Hall A B & C, Convention Center - Salt Palace
Sponsor: ASEE Headquarters

**M196A - ASEE’s Living Wall**
7:00 a.m. - 5:00 p.m., Exhibit Hall Foyer, Convention Center - Salt Palace
Sponsor: ASEE Headquarters
We’re excited to bring back the ASEE Living Wall to the Annual Conference this year!
Each year at the conference, attendees will contribute their thoughts to the Wall by writing a response to a particular question or idea. The Wall will be preserved and displayed from year to year, growing bigger and bigger, and serving as a historical document of our conference attendees’ insights, ruminations, and reflections.
We hope you’ll take a few moments to leave your legacy on the Wall, located near the Exhibit Hall.

**M196B - Sunrise Gentle Yoga**
7:00 a.m. - 7:45 a.m., South Foyer, Convention Center - Salt Palace
Sponsor: ASEE Headquarters
Join your friends and colleagues as we jump-start our day with a renewing stretch and meditation class!
(Mats and exercise clothes are not required.)

**M1109 - Sponsor Technical Session: Presented by McGraw-Hill**
7:00 a.m. - 5:00 p.m., Room 150 C - Sponsor Tech Room, Convention Center - Salt Palace
Sponsor: Sponsored Sessions

**M150 - Two-Year College Model Design Robotics Poster Session**
8:00 a.m. - 9:30 a.m., Exhibit Hall A B & C, Convention Center - Salt Palace
Sponsor: Two-Year College Division
Two-Year College Model Design Robotics Poster Session

**M193 - ASEE MONDAY PLENARY Sponsored by University of Maryland**
8:00 a.m. - 9:30 a.m., Grand Ballroom A-H, Convention Center - Salt Palace
Sponsor: ASEE Board of Directors
Join your friends and colleagues at our Monday Plenary.
In recognition of our “125 Years at the Heart of Engineering Education” anniversary celebration, an acting troupe will offer a dramatic representation of ASEE through the years. The troupe is directed by Jeffrey Steiger, known for his unique theatrical presentations of academe-themed issues.
FEATURING:
Keynote Speaker
Pierre Haren
Pierre Haren is a graduate of École Polytechnique in France, and holds a M.S. and Ph.D. from MIT. After leading a research team at INRIA on design of expert systems in the 1980s, he created ILOG in 1987, took it public on NASDAQ in 1997, and sold it to IBM in 2008. After integrating ILOG into IBM, Haren joined GBS, the consulting arm of IBM, where he spent two years as VP, Advanced Analytics and Cognitive, before creating Causality Link.
Throughout his career, Haren has led and mentored diverse teams of researchers and consultants. He has introduced on the market and deployed at customer sites a variety of products, from expert systems to advanced graphical user interfaces and operations research, as well as IBM’s Watson technologies.
He is passionate about Explicit Artificial Intelligence, at the convergence of knowledge engineering and advanced software, where knowledge representations can be understood by experts and leveraged by computers.
National Student STEM Winners
Conrad Spirit of Innovation Challenge
Team: NorthernLeap, Christopher Columbus High School, Miami, FL
American Indians and Science and Engineering Society 2017 Energy Challenge
Student: Jake Uyechi, Kamehameha High School, Honolulu, HI
Old Guard Oral Presentation Competition at IMECE
Student: Kyle Hunter, University of Southern Florida, Tampa, FL
BEST Robotics
Team: Cornerstone Christian Preparatory Academy, West Mifflin, PA
ASEE President’s Award Winner

**M196E - ASEE Bistro Sponsored by Weber State University**
10:30 a.m. - 5:00 p.m., Exhibit Hall A B & C, Convention Center - Salt Palace
Sponsor: ASEE Headquarters

**M2105 - NSF Grantees Poster Session**
9:45 a.m. - 11:15 a.m., Exhibit Hall A B & C, Convention Center - Salt Palace
Sponsor: NSF Grantees Poster Session
Moderator: Amber Genau, University of Alabama at Birmingham
In this popular poster session, investigators with currently funded NSF education projects will be available to discuss their work.

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<td>Zheng</td>
<td>Wei</td>
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<td>168</td>
<td>21179</td>
<td>First Year Experience from RET Site: Incorporating Engineering Design and Manufacturing into the High School Curriculum</td>
<td>Zhu</td>
<td>Weihang</td>
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**M250 - Two-Year College Model Design Robotics Competition**
11:30 a.m. - 1:00 p.m., IT Tutorial LAB Exhibit Hall A,B,C
Sponsor: Two-Year College Division
Two Year College Model Design Robotics Competition

**M293 - ASEE Finances Town Hall**
3:15 p.m. - 4:45 p.m., Room 250 A, Convention Center - Salt Palace
Sponsor: ASEE Board of Directors
ASEE Finances Town Hall

**M296A - Back by Popular Demand! Virtual Reality Experience**
9:30 a.m. - 6:00 p.m., Exhibit Hall A B & C, Convention Center - Salt Palace
Sponsor: ASEE Headquarters

Get immersed in the latest Virtual Reality experience - located in the back of the Exhibit Hall.

myVRadventure was created with the goal of sharing interactive STEM-based activities and emerging technologies with as many impressionable and curious minds as possible.

Through our customizable services, we deliver an out-of-this-world, engaging experience, which brings people together using a unique blend of education, science, and entertainment.

At the 2018 ASEE conference, myVRadventure will be providing 4 Room-Scale VR Stations and 4 Seated VR Stations, allowing participants to choose among several different virtual experiences, including:
- The LAB – Curated, Interactive VR Experience
- Rec Room – Multiplayer, Interactive Questing and Exciting Team Building Adventure
- FORM – Mind Bending experience where the puzzles are built from dreams and ancient memories
- The Body VR: Journey Inside a Cell - An educational virtual reality experience that takes the user inside the human body for a tour of organs, vessels, cells and more
- Escape Room - Players are prompted to solve a series of challenging puzzles to escape from their office before a microchip in their head explodes.
- Apollo 11 VR – This is the story of the greatest journey ever taken by humankind. This VR experience is a recreation of the events which took place between July 16th and July 24th, 1969.
- Fantastic Contraption – A surreal, physics-based, building and engineering game for VR. Inside the game you must create life-sized contraptions to solve puzzles on the other side of an island.
- Tilt Brush – Write, draw, and create complex paintings in Virtual Reality. Perfect for Artists and creative minds alike
- Job Simulator - Take instructions from your robot masters in the experience that allows you to become a Chef, Auto Mechanic, Store Clerk or Office Worker. Extremely Funny
- The Blu – Interactive Underwater Tour. Experience the wonder and majesty of the ocean through a series of habitats and come face to face with some of the most awe-inspiring species on the planet.
- Google Spotlight Stories - Choice of short virtual animated shorts, Including: Pearl, Special Delivery, Rain or Shine, Sonaria, Son of Jaguar. Fun and engaging for all ages
- And more to come….

(Each experience has been selected for its educational, entertainment value and length - keeping in mind that the time per experience per participant may be limited, depending on demand.)

**M296B - ASEE Exhibit Hall**
9:30 a.m. - 5:00 p.m., Exhibit Hall A B & C, Convention Center - Salt Palace
Sponsor: ASEE Headquarters

**M296C - FOCUS ON EXHIBITS: Brunch & NSF Grantees Poster Session**

Schedule subject to change: Please go to [www.asee.org/icp](http://www.asee.org/icp) for up to date information.
Conference Sessions

Monday, June 25

9:45 a.m. - 11:15 a.m., Exhibit Hall A B & C, Convention Center - Salt Palace

Sponsor: ASEE Headquarters
Our exhibitors welcome you back for food and drink to start the day. Whether it's a NASCAR, 3-D printer, or quality textbooks for your classes, you'll likely find something interesting in the hall. This event is complimentary for all attendees.

M301 - Aerospace Division Technical Session 1
11:30 a.m. - 1:00 p.m., Room 254 A, Convention Center - Salt Palace

Moderators: James Canino, Trine University; Masoud Rais-Rohani, University of Maine

- Integrated Teaching Model: A Follow-Up with Fundamental Aerodynamics
  Dr. Sidaard Gunasekaran, University of Dayton
  Applying Active Learning to an Introductory Aeronautics Class
  Dr. Kenneth W. Van Treuren, Baylor University
  High-Fidelity Digitized Assessment of Heat Transfer Fundamentals using a Tiered Delivery Strategy
  Dr. Tian Tian, University of Central Florida
  Dr. Ronald F. DeMara P.E., University of Central Florida
  Comparison of Student Learning and Flight Performance as a Function of the Method of Teaching – A Research Study
  Dr. Adeeel Khalid, Kennesaw State University
  Mr. Christopher Douglas Roper,
  J. Andrew Pirrello Jr., Kennesaw State University
  Mr. Alain J. Santos,
  K-2 Aerospace Academy: An Out-of-School Authentic and Experiential STEM Learning Experience for College and Career Pathways to Aerospace/Aviation
  Dr. Kuldeep S. Rawat, Elizabeth City State University
  Dr. Ellis Eugene Lawrence, Elizabeth City State University
  Ms. Robin Renee Mangham, Elizabeth City State University
  Cmrd. Orestes Devino Gooden, Elizabeth City State University

M304 - Active Learning in BME, Session I
11:30 a.m. - 1:00 p.m., Room 155 B, Convention Center - Salt Palace

Moderator: Sarah Rooney, University of Delaware
New initiatives that incorporate active learning in BME courses
- Student Assessment of Active Learning Elements in 100-level Introductory Biomedical Engineering Course
  Nicole L. Ramo, Colorado State University
  Jasmine Erin Nejad, Colorado State University
  Prof. Ketul C. Popat, Colorado State University
  Dr. Kimberly Catton P.E., Colorado State University
- Learner Satisfaction and Quality of Student-Faculty Interactions in Traditional vs. Blended Classrooms
  Dr. Brian P. Helmk, University of Virginia
  Dr. William H. Guilford, University of Virginia
- Introducing Active Learning Strategies into an Undergraduate

M305 - Chemical Engineering Division Executive Board Meeting
11:30 a.m. - 1:00 p.m., Room 250 D, Convention Center - Salt Palace

Sponsor: Chemical Engineering Division
This meeting is open only to Chemical Engineering executive board members.

M306 - Creating a Positive Environment for Learning
11:30 a.m. - 1:00 p.m., Room 355 D, Convention Center - Salt Palace

Sponsor: Civil Engineering Division
Moderators: Derek Williamson, University of Alabama; Matthew Sleep, Oregon Institute of Technology

- An Investigation of the Effect of Curriculum-embedded Peer Mentoring on Student Learning in Two Undergraduate Mechanics Courses
  Dr. Molly McVey, University of Kansas
  Dr. Caroline R. Bennett PE., University of Kansas
  Dr. Carl W. Luchies, University of Kansas
  Prof. Rémy Lequesne,
  Peer-Led-Team-Learning in a Mechanics I: Statics Course
  Dr. James E. Lewis, University of Louisville
  Dr. Thomas D. Rockaway, University of Louisville
  Dr. Gerold Willing, University of Louisville
- Evaluating the Use of Peer Instruction in Civil Engineering Courses
  Dr. Shannon Bartelt-Hunt, University of Nebraska, Lincoln
  Dr. Elizabeth G. Jones, University of Nebraska, Lincoln
  Dr. Richard L. Wood, University of Nebraska, Lincoln
  Dr. Robert M. Erdmann, University of Nebraska, Lincoln
  Marilyne Stains, University of Nebraska, Lincoln
- Enhancing Student Learning by Providing a Failure Risk-free Environment and Experiential Learning Opportunities
  Stephen J. Phillips, University of Waterloo
  Kayleanna Giesinger, University of Waterloo
  Dr. Rania Al-Hammoud P.Eng., University of Waterloo
  Prof. Scott Walbridge,
  Dr. Chris Carroll, Saint Louis University
- Keeping a Prospect on the Line and Then in the Boat: Recruitment and Retention Efforts that Make a Difference
  Dr. Judy L. Cezeaux, Western New England University
  Dr. Thomas K. Keyser, Western New England University
- Exploring an Inquiry-based Learning with Peer-teaching Pedagogy in a Physiological Signals Lab Course
  Jennifer Bailey, Rochester Institute of Technology (COE)
- Exploring Biomedical Engineering Students’ Self-Raised Motivations for Engaging in Instructional Design
  Jacqueline Handley, University of Michigan
  Dr. Aileen Huang-Saad, University of Michigan
  Miss Cassandra Sue Ellen Woodcock, University of Michigan

Schedule subject to change: Please go to www.asee.org/icp for up to date information
Conference Sessions

Monday, June 25

Dr. Ronald W. Welch, The Citadel
Dr. Kevin C. Bower P.E., The Citadel
Dr. Robert J. Rabb P.E., The Citadel
Ally Kindel Martin, The Citadel
Dr. Robert J. Rabb P.E., The Citadel

Identifying Factors for Retention of Engineering Students in the First Two Years
Mr. Mohammad R. Gorakhki, Colorado State University
Dr. Kimberly Catton P.E., Colorado State University
Nabila A. Huq,
Dr. Anthon y J. Marchese, Colorado State University
Mr. Daniel W. Baker Ph.D., P.E., Colorado State University

M308 - ASEE CoED Current Officers Meeting
11:30 a.m. - 1:00 p.m., Room 250 B, Convention Center - Salt Palace
Sponsor: Computers in Education Division
This is a meeting for only current officers of the CoED Division. Topics to be discussed include the state of the journal, division management, and other current and relevant issues.

M308B - COED: Issues Impacting Students Learning How to Program
11:30 a.m. - 1:00 p.m., Room 355 B, Convention Center - Salt Palace
Sponsor: Computers in Education Division
Moderator: Susan Miertschin, University of Houston, College of Technology
This session will focus on papers related to teaching students how to program computers in the realm of CS1 and other first programming courses.

An Analysis of Common Errors Leading to Excessive Student Struggle on Homework Problems in an Introductory Programming Course
Nabeel Alzahrani, University of California, Riverside
Prof. Frank Vahid, University of California, Riverside
Dr. Alex Daniel Egdcomb, zyBooks
Prof. Roman Lysecky, University of Arizona
Dr. Susan Lysecky, zyBooks

Coding the Coders: A Qualitative Investigation of Students’ Commenting Patterns
Dr. Mahnas Jean Mohammadi-Aragh, Mississippi State University
Ms. Phyllis J. Beck, Mississippi State University
Ms. Amy K. Barton, Mississippi State University
Dr. Donna Reese, Mississippi State University
Dr. Bryan A. Jones, Mississippi State University
Ms. Monika Jankun-Kelly, Mississippi State University

Data-driven Curricular Decisions in Introductory Computing Classes
Prof. Petra Bonfert-Taylor, Dartmouth College
Mr. Alisan Oeztuerk, German Army
Mr. Ben Servoz, Dartmouth College

Literate Programming for Authorship of Interactive Textbooks for Programming-centric Courses
Dr. Bryan A. Jones, Mississippi State University
Ms. Jane N. Moorhead, Mississippi State University

M309 - Construction Division Technical Session I: Assessments
11:30 a.m. - 1:00 p.m., Room 252, Convention Center - Salt Palace
Sponsor: Construction Engineering Division
Moderators: Fadi Castronovo, California State University, East Bay; Gouranga Banik, Oklahoma State University

Analysis and Assessment of Graduate Students’ Perception and Academic Performance Using Open Educational Resource (OER)
Course Materials
Thahomina Jahan Nipa,
Dr. Sharareh Kermanshachi, University of Texas at Arlington
Outcomes Assessment in an ACCE Construction Management Program
Dr. David L. Batie, East Carolina University

M310 - CPDD Networking Luncheon
11:30 a.m. - 1:00 p.m., Salon A, HQ Hotel - Marriott at City Creek
Sponsor: Continuing Professional Development Division
Networking opportunity over lunch for current and prospective members of the Continuing Professional Development Division.
Ticketed event: $25.00 advanced registration and $35.00 on site registration

M3102 - EDC Executive Board Meeting/Lunch (By Invitation Only)
11:30 a.m. - 1:25 p.m., Salon B, HQ Hotel - Marriott at City Creek
Sponsor: Engineering Deans Council
This is the meeting and luncheon of the Engineering Deans Council Executive Board.

M3103 - Building a Research Scholarship Program
11:30 a.m. - 1:00 p.m., Room 151 A, Convention Center - Salt Palace
Sponsor: Engineering Research Council
Moderator: Pamela Marie Norris, University of Virginia
Speakers: Dr. Pamela Marie Norris, University of Virginia; Dr. Jean S. VanderGheynst, University of California, Davis; Dr. Donna M Riley, Purdue University-Main Campus, West Lafayette (College of Engineering)
Research and scholarship are important responsibilities of engineering faculty and major considerations for tenure and promotion. Extramural funding is required to support faculty and graduate students in the pursuit of such new knowledge. The proposal process is extremely competitive and involves more than developing and submitting quality proposals. In this session, we will have three invited panelists to make presentations addressing different aspects of this topic, including funding for educational research.

M3109A - Sponsor Technical Session: Using the FE Exam for Effective Outcomes Assessment—
M3112A - Action on Diversity - Safe Zone Ally Training (Level 2)
11:30 a.m. - 1:00 p.m., Room 150 E, Convention Center - Salt Palace
Sponsors: ASEE Diversity Committee; Minorities in Engineering Division; International Division
Speakers: Dr. Rocio C. Chavela Guerra, American Society for Engineering Education; Prof. Anthony Butterfield, University of Utah; Mr. Hector Enrique Rodriguez-Simmonds, Purdue Engineering Education

{Tickets are requested for planning purposes only! Please come even if you do not sign up in advance.}

Did you know…
1 in 5 LGBTQIA+ students fear for their safety on college campuses?
1 in 3 LGBTQIA+ student are made to feel uncomfortable in our classrooms?
LGBTQIA+ engineering students are more likely than women, underrepresented minorities, and non-LGBTQ peers to report a chilly climate

• STEM departments are lagging way behind other disciplines in the adoption of LGBTQIA+-inclusive practices.
• You can help change this! Safe Zone Ally Training is a series of interactive workshops for students, faculty and the professional community, during which participants will build the knowledge and skills needed to create a more inclusive and affirming environment for LGBTQIA+ individuals in engineering. The workshops have been developed by a community of Science and Engineering professionals and students, specifically for a STEM audience.

Safe Zone Level 1 focuses on understanding LGBTQIA+ concepts and the coming out process, responding to bias, and adopting simple strategies for building an inclusive environment.
Safe Zone Level 2 discusses aspects of engineering culture that act as barriers to LGBTQIA+ equality and explore heterosexual and cisgender privilege. Participants learn to recognize bias and disrupt discrimination.
The Deep Dive LGBTQIA+ Inclusion workshop focuses on creating a supportive and inclusive environment for transgender students and colleagues.
Conference Sessions

Participants in Levels 1 and 2 will receive a Safe Zone sticker to display in their workplace. Digital badges will be awarded for participation in each workshop in the Safe Zone series.

Free ticketed event

**M3112B - Building and Engaging Communities for Scholarship, Advocacy, and Action for Diversity, Equity, and Inclusion**
11:30 a.m. - 1:00 p.m., Room 151 D, Convention Center - Salt Palace
**Sponsors:** ASEE Diversity Committee; International Division; Minorities in Engineering Division
**Moderator:** Christopher Carr, National Society of Black Engineers
This session begins with two papers providing overview perspectives of the first few years of the ASEE Diversity Committee: One summarizes the activities and advocacy initiatives of the committee and the other summarizes the first three years’ finalists for Best Diversity Paper. These presentations will help ASEE members identify ways to be involved or promote Diversity Committee initiatives and resources to their other engineering communities. In the second half of the session, Dr. Alice Pawley from Purdue University will lead ASEE members in a conversation to explore the current era’s negative repercussions on scholarship and advocacy related to diversity, equity, and inclusion, and to develop strategies for providing the explicit organizational, institutional, and peer support needed by our community.

*Activity of the ASEE Diversity Committee: Engaging a Community in Diversity, Advocacy, and Inclusive Practices*
- Prof. Rebecca A. Bates, Minnesota State University, Mankato
- Mr. Eric Specking, University of Arkansas
- Dr. Adrienne Minerick, Michigan Technological University
- Dr. Stephanie Farrell, Rowan University
- Dr. Rocío C. Chavela Guerra, American Society for Engineering Education

The 2015, 2016, and 2017 Best Diversity Papers: Summary and Perspective
- Dr. Janet Callahan, Boise State University
- Dr. Stephanie Farrell, Rowan University
- Dr. Adrienne Robyn Minerick, Michigan Technological University

**M3116 - ABET SESSION: Accreditation Information Session 2018**
11:30 a.m. - 1:00 p.m., Room 150 D, Convention Center - Salt Palace
**Sponsor:** ABET Sponsored Sessions
If you are new to ABET accreditation or have programs that are seeking ABET accreditation for the first time—this session is for you. Topics include what types of programs are accredited, what the accreditation criteria and procedures are, who writes them, who serve as evaluators and how they are assigned to your program, who makes final accreditation decisions and why, how assessment tools are used and misused in the ABET process, and who ABET matters to (and why). Come ready with your questions and feedback for senior ABET representatives.

Monday, June 25

**M311B - Integrating Experiential Learning into the Curriculum**
11:30 a.m. - 1:00 p.m., Room 155 D, Convention Center - Salt Palace
**Sponsor:** Cooperative and Experiential Education Division
**Moderator:** Diane LaFreniere, Grand Valley State University
This session begins with two papers providing overview perspectives of the first few years of DEED. The five best paper candidates from DEED present their work.

**Using Experiential Learning in Course Curriculum: The Case of a Core Engineering Graphics Course**
- Dr. Martha M. Snyder, Nova Southeastern University
- Dr. Manuel Salinas, Nova Southeastern University
- Dr. Molly J. Scanlon, Nova Southeastern University

**Integrating Design Thinking into an Experiential Learning Course for Freshman Engineering Students**
- Dr. Mark J. Povinelli, Syracuse University
- Jonnell A. Robinson, Syracuse University

**Improving Students’ Writing Skills by Integrating Prototyping Activities in their Writing Course**
- Dr. Amy Hodges, Texas A&M University at Qatar
- Dr. Yasser M. Al Hamidi, Texas A&M University at Qatar

**Assessing the Active Learning in Engineering Education Based on BOPPPS Model**
- Prof. Fu Zhongli, National University of Defense Technology
- Dr. Zihan Lin, National University of Defense Technology
- Prof. Christian Desrosiers, École de Technologie Supérieure
- Mr. Jerome Harrison, École de Technologie Supérieure
- Dr. Yasser M. Al Hamidi, Texas A&M University at Qatar

**Promoting Good Scientific Communication Habits by Leveraging the Community of Practice within a Single Research Group**
- Mr. Félix Langevin Harnois, École de Technologie Supérieure
- Dr. Ghizlane El Boussaidi, École de Technologie Supérieure
- Dr. Changfang Zhang, National University of Defense Technology
- Miss Tianqi Zhang, National University of Defense Technology
- Dr. Zhao Zhao, National University of Defense Technology
- Dr. Tong Wu, National University of Defense Technology
- Dr. Huang Zhang, National University of Defense Technology
- Mrs. Zhang Jianing, Changsha SunVote Limited, China
- Prof. Christian Desrosiers, École de Technologie Supérieure
- Catherine Laporte, École de Technologie Supérieure

**M313 - The BEST InDEED**
11:30 a.m. - 1:00 p.m., Room 253 B, Convention Center - Salt Palace
**Sponsor:** Design in Engineering Education Division
The five best paper candidates from DEED present their work.

**Exploring Students’ Product Design Concept Generation and Development Practices**
- Christine A. Friel, Rochester Institute of Technology
- Dr. Anthony K. D. Mazur, University of Michigan, Dearborn
- Dr. Joseph M. Pasko, Missouri University of Science and Technology
- Dr. Yasser M. Al Hamidi, Texas A&M University at Qatar
- Prof. Fu Zhongli, National University of Defense Technology
- Dr. Changfang Zhang, National University of Defense Technology
- Miss Tianqi Zhang, National University of Defense Technology

Schedule subject to change: Please go to www.asee.org/icp for up to date information
Conference Sessions

Monday, June 25

M313B - Design in Engineering Education Division Technical Session 4
11:30 a.m. - 1:00 p.m., Room 260 A, Convention Center - Salt Palace
Sponsor: Design in Engineering Education Division

M314A - Open session of the FIE Executive Board
11:30 a.m. - 1:00 p.m., Room 250 F, Convention Center - Salt Palace
Sponsor: Educational Research and Methods Division
Open session of FIE planning committee.

M314B - System 1 in Engineering Education and Research
11:30 a.m. - 1:00 p.m., Room 255 C, Convention Center - Salt Palace
Sponsor: Educational Research and Methods Division
Moderators: Cory Brozina, Youngstown State University; Stephany Santos, University of Connecticut
Educational Research and Methods Division Technical Session
Validity Evidence for the SUCCESS Survey: Measuring Non-Cognitive and Affective Traits of Engineering and Computing

Students
Mr. Matthew Scheidt, Purdue University, West Lafayette
Dr. Allison Godwin, Purdue University, West Lafayette
(College of Engineering)
Mr. Ryan R. Senkpeil, Purdue University, West Lafayette
(College of Engineering)
Ms. Julianna Sun Ge, Purdue University, West Lafayette
(College of Engineering)
Dr. John Chen P.E., California Polytechnic State University, San Luis Obispo
Dr. Brian P. Self, California Polytechnic State University, San Luis Obispo
Dr. James M. Widmann, California Polytechnic State University, San Luis Obispo
Dr. Edward J. Berger, Purdue University, West Lafayette
(College of Engineering)

Toward the Development of a Revised Decision-Making Competency Instrument
Dr. Marisa K. Orr, Clemson University
Ms. Katherine M. Ehlerl, Clemson University
Maya Rucks, Clemson University
Dr. Mitzi Desselles, Louisiana Tech University

Shame Amid Academic Success: An Interpretative Phenomenological Analysis Case Study of a Student's Experience with Emotions in Engineering
Dr. James L. Huff, Harding University
Mr. Kanembe Shanachilubwa, Harding University
Dr. Stephen Secules, University of Georgia

Work in Progress: Got Intuition? Exploring Student Intuition in Response to Technology-aided Problem Solving
Dr. Elif Miskioglu, Bucknell University
Prof. Kaela Mae Martin, Embry-Riddle Aeronautical University, Prescott

Work in Progress: A Multi-Modal Method for Assessing Student Emotions During Programming Tasks
Ms. S. Zahra Atiq, Purdue University, West Lafayette
(College of Engineering)

M314C - Social Dialogue on Diversity and Inclusion
11:30 a.m. - 1:00 p.m., Room 155 E, Convention Center - Salt Palace
Sponsor: Educational Research and Methods Division
Moderators: Renata Revelo, University of Illinois, Chicago; Prateek Shekhar, University of Michigan
Educational Research and Methods Division Technical Session
Work in Progress: Progress of the NSF RED Revolution
Dr. Susan M. Lord, University of San Diego
Dr. Beena Sukumaran, Rowan University
Dr. Ella Lee Ingram, Rose-Hulman Institute of Technology
Dr. Anthony A. Maciejewski, Colorado State University
Prof. James D. Sweeney, Oregon State University
Prof. Thomas Martin, Virginia Tech
Prof. Joseph M. LeDoux, Georgia Institute of Technology

Schedule subject to change: Please go to www.asee.org/icp for up to date information
Monday, June 25

Conference Sessions

Polytechnic campus
Dr. Noah Salzman, Boise State University

Social Dialogue in the Engineering Classroom: The Effect of National Events on the Political and Social Attitudes of First-Year Engineering Students
Ms. Tara C. Langus, University of Nevada, Reno
Mr. Hector Enrique Rodriguez-Simmonds, Purdue University, West Lafayette (College of Engineering)
Mr. Justin Charles Major, Purdue University, West Lafayette (College of Engineering)
Dr. Allison Godwin, Purdue University, West Lafayette (College of Engineering)
Dr. Adam Kirn, University of Nevada, Reno

Understanding the Investment of Underrepresented Minorities in Doctoral Engineering Programs
Ms. Mayra S. Artiles, Virginia Tech
Dr. Holly M. Matusovich, Virginia Tech
Dr. Stephanie G. Adams, Old Dominion University
Coletta Bey, Old Dominion University

STEM Experiences of Engineering Students From Low-Socioeconomic Neighborhoods
Mr. Justin Charles Major, Purdue University, West Lafayette (College of Engineering)
Dr. Allison Godwin, Purdue University, West Lafayette (College of Engineering)
Dr. Gerhard Sonnert, Harvard University
Dr. Philip Michael Sadler, Harvard Smithsonian Center for Astrophysics

Using Social Network Analysis to Study the Social Structures of Inclusion
Mr. Nelson S. Pearson, University of Nevada, Reno
Mr. Justin Charles Major, Purdue University, West Lafayette (College of Engineering)
Dr. Allison Godwin, Purdue University, West Lafayette (College of Engineering)
Dr. Adam Kirn, University of Nevada, Reno

M315 - Electrical and Computer Division
Technical Session 1
11:30 a.m. - 1:00 p.m., Room 255 E, Convention Center - Salt Palace
Sponsor: Electrical and Computer Division
Moderator: William Palm, Roger Williams University

Bottlenecks and Muddiest Points in a Freshman Circuits Course
Dr. Cynthia Furse, University of Utah
Prof. Neil E. Cotter, University of Utah
Prof. Angela Rasmussen, University of Utah

Time for Reflection: Development of Twenty Short Videos to Introduce New Topics and Engage Students in Circuit Theory
Dr. Benjamin David McPherson, Roger Williams University
Dr. Charles R. Thomas, Roger Williams University
Dr. William J. Palm, Roger Williams University

A Systematic Literature Review of Misconceptions in Linear Circuit Analysis
Dr. Nikitha Sambamurthy, zyBooks
Dr. Alex Daniel Edgcomb, zyBooks

Engineering Habits of Mind: How EE Majors Talk About Their Knowledge of Circuits
Dr. Nicole P. Pitterson, Virginia Polytechnic Institute and State University
Dr. Natasha Perova-Mello, Purdue University, West Lafayette
Dr. Ruth A. Streveler, Purdue University, West Lafayette

Rethinking Non-major Circuits Pedagogy for Improved Motivation
Steven Bell, Stanford University
Prof. Mark Horowitz, Stanford University

M316 - Energy Conversion and Conservation Division Technical Session on Solar
11:30 a.m. - 1:00 p.m., Room 258, Convention Center - Salt Palace
Sponsor: Energy Conversion and Conservation Division
Moderators: Madhumi Mitra, University of Maryland, Eastern Shore; Ted Song, John Brown University

Experimental Field Trial of Self-cleaning Solar Photovoltaic Panels
Dr. Kenneth A. Walz, Madison Area Technical College
Mr. Joel B. Shoemaker, Madison Area Technical College
Ms. Ashley Jordan Scholes, Madison Area Technical College
Hao Jiang, University of Wisconsin, Madison
Dr. Jessica M.S. Silva, Azelis
Mrs. Jennifer Sanfilippo M.S., L.A.T., University of Wisconsin, Madison
Dr. Walter A. Zeltner, Microporous Oxides Science and Technology, L.L.C.
Prof. Marc Arlen Anderson, Imdea Energía, Madrid

Modernized Teaching Methods for Solar Energy Projects
Prof. William Hutzel, Purdue University, West Lafayette
Dr. Jan T. Lugowski, Purdue University, West Lafayette

Impacts on Teaching Practices from a Solar Photovoltaic Institute Faculty Professional Development Program
Dr. Kenneth Walz, Madison Area Technical College
Mr. Joel B. Shoemaker, Madison Area Technical College
Mr. Scott Liddicoat, Green Bay Southwest High School
Mr. Cris Folk, Madison College

Solar Energy Education at Grand Valley State University
Dr. Lihong (Heidi) Jiao, Grand Valley State University

M317 - Engineering and Public Policy
11:30 a.m. - 1:00 p.m., Room 151 B, Convention Center - Salt Palace
Sponsor: Engineering and Public Policy Division
Panel session with invited keynote speaker plus best papers from abstract submissions.

M318 - EDGD: Assessment & Student Learning
11:30 a.m. - 1:00 p.m., Room 251 F, Convention Center - Salt Palace
Sponsor: Engineering Design Graphics Division
Panel session with invited keynote speaker plus best papers from abstract submissions.
Conference Sessions

Monday, June 25

Moderators: Diana Bairaktarova, Virginia Tech; Leroy Long, Embry-Riddle Aeronautical Univ., Daytona Beach

Formative Feedback For Improved Student Performance Through Adaptive Comparative Judgement
- Dr. Scott R. Bartholomew, Purdue University, West Lafayette
- Dr. Greg J. Strimel, Purdue University, West Lafayette
- Dr. Esteban Garcia, Emily Yoshikawa, Purdue University, West Lafayette
- Liwei Zhang

Evaluating Concepts Presented in a Geometric Dimensioning and Tolerancing Course
- Dr. Theodore J. Branoff, Illinois State University

Application of Data Analytics Approach to Spatial Visualization Test Results
- Dr. Jorge Rodriguez P.E., Western Michigan University
- Dr. Luis Genaro Rodriguez, University of Wisconsin, Waukesha

Sketching, Assessment, and Persistence in Spatial Visualization Training On a Touchscreen
- Prof. Nathan Delson, University of California, San Diego
- Dr. Lelli Van Den Einde, University of California, San Diego

M319 - ASEE Engineering Economy Division Business Meeting
11:30 a.m. - 1:00 p.m., Room 251 B, Convention Center - Salt Palace
Sponsor: Engineering Economy Division
Business meeting to discuss the yearly activities of the division and the PIC. Topics include the division financials, activities at the annual conference, election of division officers, and updates on the division awards and on The Engineering Economist journal.
Free ticketed event

M320 - Engineering Ethics Division Technical Session 1
11:30 a.m. - 1:00 p.m., Room 355 C, Convention Center - Salt Palace
Sponsor: Engineering Ethics Division
Moderators: Jonathan Beever, University of Central Florida; Joel Mejia, University of San Diego

Effective Ethics Education: Examining Differing Faculty Perspectives
- Dr. Angela R. Bielefeldt, University of Colorado, Boulder
- Ms. Madeline Polmear, University of Colorado, Boulder
- Dr. Chris Swan, Tufts University
- Dr. Daniel Knight, University of Colorado, Boulder
- Dr. Nathan E. Canney

Creating Faculty Buy-in for Ethics-across-the-curriculum: Year One of Developing an Ethics Curriculum in an Undergraduate Biological Engineering Program
- Dr. Xiaofeng Tang, Ohio State University
- Dr. Jeffrey M. Catchmark, Pennsylvania State University

M321 - ELD Welcome and Lightning Talks
11:30 a.m. - 1:00 p.m., Salon E, HQ Hotel - Marriott at City Creek
Sponsor: Engineering Libraries Division
Kick off the conference with food and a chance to see what several colleagues have been doing.
Free ticketed event

M322 - Curriculum and the Classroom
11:30 a.m. - 1:00 p.m., Room 150 G, Convention Center - Salt Palace
Sponsor: Engineering Management Division
Moderator: Elizabeth Cudney, Missouri University of Science & Technology

Developing a Leadership and Diversity Course for an Engineering Management Program
- Dr. Sandra L. Furterer, University of Dayton

Enhancing Engineering Management Courses with Global Market Concerned Projects and Case Studies
- Dr. S. Gary Teng, The University of North Carolina at Charlotte

Using A Fun Six Sigma Project to Teach Quality Concepts, Tools, and Techniques
- Dr. Mustafa Shraim, Ohio University

Development of a Design Division for an Industry: A Capstone Project in a Master’s of Engineering Management Program
- Dr. Sangarappillai Sivaloganathan, United Arab Emirates University
- Dr. Salah Burhan Al Omari P.E., United Arab Emirates University
- Mrs. Aysha Al Ameri P.E., United Arab Emirates University

The Future of Project-based Learning for Engineering and Management Students: Towards an Advanced Design Thinking Approach
- Prof. Victor Taratukhin, SAP America
- Dr. Natalia Pulyavina, Plekhanov Russian University of Economics
Monday, June 25

M323 - ECET Dept Heads Meeting
11:30 a.m. - 1:00 p.m., Room 250 C, Convention Center - Salt Palace
Sponsor: Engineering Technology Division
Annual business meeting

M325 - Environmental Engineering Division Technical Session 1
11:30 a.m. - 1:00 p.m., Room 255 A, Convention Center - Salt Palace
Sponsor: Environmental Engineering Division
Moderator: Arthur Kney, Lafayette College

A Case Study: Undergraduate Research and Resilience in 3D
Dr. Fethiy Ozis P.E., Northern Arizona University
Dr. Sahar Razavi, Northern Arizona University
Ms. Nihal Sarikaya, Northern Arizona University

Generating Interest Among Undergraduates Toward Research in Environmental Engineering by Incorporating Novel Desalination Technology-based Hands-on Laboratory Assignments
Dr. Sanjay Tewari, Louisiana Tech University
Mr. Md Ashique Ahmed, Louisiana Tech University
Mr. Chandra Mouli Tummala, Louisiana Tech University
Mr. Md Ashique Ahmed, Louisiana Tech University

Hands-on Activities to Improve Students’ Conceptual Understanding of Water Hardness
Dr. Brenda Read-Daily, Elizabethtown College

M326 - Division for Experimentation and Lab-oriented Studies Technical Session 5
11:30 a.m. - 1:00 p.m., Room 257 B, Convention Center - Salt Palace
Sponsor: Experimentation and Laboratory-Oriented Studies Division

Pedagogy of I.Laboratory-oriented Courses.

A Course Improvement Strategy That Works: The Improvement of Student Satisfaction Scores in a Lecture and Laboratory Course
Ms. Tracy L. Yother, Purdue Polytechnic Institute
Prof. Mary E. Johnson Ph.D., Purdue Polytechnic Institute
Prof. James M. Thom, Purdue University

Alternative Approaches to Undergraduate Engineering Laboratory Experience for Low-income Nations
Kimia Moozeh, University of Toronto
Dr. Nadine Ibrahim, University of Toronto
Dr. Rahim Rezaie, University of Toronto
Dr. Yacob Astatke, Morgan State University
Prof. Murray R. Metcalfe, University of Toronto
Dr. Greg Evans, University of Toronto

Work in Progress - Group Laboratory Experiment During Lecture in an Undergraduate Fluid Dynamics Class: Increasing Student Learning and Communication Skills
Dr. Ryan Anderson, Montana Engineering Education Research Center
Dr. Tariq Akmal, Washington State University
Dr. Phillip Himmer, Montana State University

Voice of the Students: Continuous Lab Course Improvement Using Student Feedback
Dr. Bridget M. Smyser, Northeastern University
Student Reflections on Experiences Gained from an Open-ended Problem-solving Bio-signals Laboratory
Dr. Renee M. Clark, University of Pittsburgh
Dr. Arash Mahboobin, University of Pittsburgh

The Effects of Remote Laboratory Implementation on Freshman Engineering Students’ Experience
Ms. Sulakshana Lal, Curtin University
Prof. Anthony Denis Lucey, Curtin University
Prof. Euan Lindsay, Charles Sturt University
Prof. David Franklin Tregust, Curtin University
Dr. Mauro Mecelino, Curtin University
Dr. John Matthew Long, Deakin University
Prof. Marjan G. Zadnik, Curtin University of Technology

M327 - First-year Programs Division: Best Papers
11:30 a.m. - 1:00 p.m., Room 254 B, Convention Center - Salt Palace
Sponsor: First-Year Programs Division
Moderators: John Estell, Ohio Northern University; Rachel McCord, University of Tennessee, Knoxville

This session includes the five papers considered for the division award. The winner and finalists will be announced during the session.

Academic Advising and Student Affairs Working Together to Improve First-year Experience of Engineering Students
Heather Kathleen Klok Bacon
Dr. J. Alex Birdwell, Northwestern University
Dr. Ordel Brown, Northwestern University
Dr. Emma Tevaarwerk, Northwestern University
Prof. Richard Wayne Freeman P.E., U.S. Coast Guard Academy
Wendy Roldan, University of Washington
Ken Gentry, Northwestern University
Amanda Rose Pokryfky, First-year Engineering Teaching Assistant Training: Examining Different Training Models and Teaching Assistant Empowerment
Andrew Phillips, Ohio State University
Dr. Krista M. Kecskenemty, Ohio State University
Dr. David A. Delaine, Ohio State University

Reactions from First-year Engineering Students to an In-depth Growth Mindset Intervention
Dr. Emily Dringenberg, Ohio State University
Amena Shermadou, Ohio State University
Prof. Amy Rachel Betz, Kansas State University

The Effects of Professional Development and Coaching on Teaching Practices
Dr. Eugene Judson, Arizona State University
Lydia Ross, Arizona State University
Kara L. Hjelmstad, Arizona State University
Prof. Stephen J. Krause, Arizona State University
Dr. Keith D. Hjelmstad, Arizona State University
Mrs. Lindy Hamilton Mayled, Arizona State University
Conference Sessions

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Prof. James A. Middleton, Arizona State University
Using Design Challenges to Develop Empathy in First-year Courses
Jordan Orion James, University of New Mexico
Dr. Vanessa Svihla, University of New Mexico
Chen Qiu M.Sc., University of New Mexico
Mr. Christopher Riley

M328 - Design and Implementation of Graduate Education
11:30 a.m. - 1:00 p.m., Room 254 C, Convention Center - Salt Palace
Sponsor: Graduate Studies Division
Moderator: Ramana Pidaparti, University of Georgia
Papers related to the design, implementation, and evaluation of graduate courses and programs in engineering.
Implementing a Graduate Class in Research Data Management for Science and Engineering Students
Dr. Joseph H. Holles, University of Wyoming
Mr. Larry Schmidt, University of Wyoming
Implementing a 'Design for Online' Approach for Engineering Courses
Ms. Jennifer M. Mansfield, Arizona State University
Dr. Terry L. Alford, Arizona State University
N. David Theodore, Arizona State University
Misconception Clarification in Online Graduate Courses
Ms. Jennifer Mansfield, Arizona State University
Dr. Terry L. Alford, Arizona State University
N. David Theodore, Arizona State University
Training Model for 21st Century Graduate Education Through Engagement to Action
Meredith Welch-Devine, University of Georgia
Dr. Ramana Pidaparti, University of Georgia
Dr. K. Paige Carmichael, University of Georgia
Dr. Janet E. Rechtman, University of Georgia
Dr. Brandy B. Walker, University of Georgia
Dr. Julie A. Coffield, University of Georgia
Pragmatic Framework for Graduate-level Sustainability Capstone Projects
Mr. Ben D. Radhakrishnan, National University

M330 - Computing and Information Technology: Curriculum and Assessment
11:30 a.m. - 1:00 p.m., Room 151 F, Convention Center - Salt Palace
Sponsor: Computing and Information Technology Division
Moderator: Tamer Omar, California State Polytechnic University, Pomona
Leveraging the power of Matlab, SPSS, EXCEL, and Minitab for Statistical Analysis and Inference
Dr. Mohammad Rafig Muqri, DeVry University, Pomona
Nikole Harper
Hasan Muqri
Mr. Brian Keith Wesr Sr.
Modernizing Capstone Project: External and Internal Approaches
Prof. Karen H. Jin, University of New Hampshire
Prof. Michael Jonas, University of New Hampshire
Prof. Christopher David LeBlanc, University of New Hampshire
Prof. Theodore Sean Tavares, University of New Hampshire
Hands-on Labs and Tools for Teaching Software Defined Network (SDN) to Undergraduates
Dr. Emil H. Salib, James Madison University
Mr. John David Lester
Implementation of Big Data Lab for Broadband Wireless Networks: Intelligent Traffic Management System: Evaluation and Challenges
Dr. Tamer Omar, California State Polytechnic University, Pomona

M332 - International Division Annual Meeting
11:30 a.m. - 1:00 p.m., Room 251 A, Convention Center - Salt Palace
Sponsor: International Division
Business Meeting

M334 - Ethical Awareness and Social Responsibility in a Corporate/Team Context
11:30 a.m. - 1:00 p.m., Room 355 A, Convention Center - Salt Palace
Sponsor: Liberal Education/Engineering & Society Division
Moderator: Rosalyn Berne, University of Virginia
Social Responsibility in Engineering Education and Practice: Alignments, Mismatches, and Future Directions

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Conference Sessions

Dr. Jessica Mary Smith, Colorado School of Mines
Dr. Juan C. Lucena, Colorado School of Mines
Exploring Team Social Responsibility in Multidisciplinary Design Teams
Katharine E. Miller, Purdue University, West Lafayette
Dr. Carla B. Zoltowski, Purdue University, West Lafayette
Patrice Marie Buzzanell, University of South Florida
David Torres, Purdue University, West Lafayette
Danielle Cople, Purdue University
Dr. Megan Kenny Feister, California State University, Channel Islands
Project-based Learning as a Vehicle for Social Responsibility and Social Justice in Engineering Education
Dr. Greg Rulifson P.E., Colorado School of Mines
Dr. Carrie J. McClelland P.E., Colorado School of Mines
Dr. Linda A. Battalora, Colorado School of Mines
Developing an Integrated Curriculum-wide Teamwork Instructional Strategy
Dr. Natasha D. Mallette P.E., Oregon State University
Michelle Kay Bothwell, Oregon State University
Dr. Christine Kelly, Oregon State University

M335 - Design and Development Projects and Practices
11:30 a.m. - 1:00 p.m., Room 151 C, Convention Center - Salt Palace
Sponsor: Manufacturing Division
Moderators: Irina Ciobanescu Husanu, Drexel University; Aditya Akundi, University of Texas, El Paso
Design and Development Projects and Practices
An Engineering Education Project: Using a Robot and Thermal Imaging to Automate and Analyze Ultrasonic Welding of Plastics
Dr. Michael G Mauk P.E., Drexel University
Dr. Richard Chiou, Drexel University
Mr. Prashant Yadav
Enhanced 3-D Printing for Energy Harvesting Project Implementation into Green Energy Manufacturing Laboratory
Dr. Richard Chiou, Drexel University
Dr. Michael G Mauk P.E., Drexel University
Prof. Tzu-Liang Bill Tseng, University of Texas, El Paso
Mr. Sanjay Jayadev, Drexel University
Mr. Carlos Michael Ruiz, Drexel University
Engineering Manufacturing Education: Solar Cell Analysis and Diagnostics Using Scanning and Imaging Techniques
Dr. Michael G Mauk P.E., Drexel University
Dr. Richard Chiou, Drexel University
Mr. Carlos Michael Ruiz, Drexel University
Ms. Carol Jeanice Martin
Mr. Smarth H Chadha, Drexel University
Integration of Agriculture Research into Manufacturing Design and Implementation Projects
Dr. Zhenhua Wu, Virginia State University
Dr. Laban K. Rutto
Dr. Shahzad Akbar, Virginia State University
Manufacturing Applications of the One-dimensional Cutting Stock Problem as a Team Project
Dr. Hüseyin Sarper P.E., Old Dominion University
Dr. Nebojsa I Jaksic P.E., Colorado State University, Pueblo

M336 - Materials Division Technical Session 3
11:30 a.m. - 1:00 p.m., Room 259, Convention Center - Salt Palace
Sponsor: Materials Division
Moderators: Alison Polasik, Ohio State University; Marc Fry, Granta Design, Ltd.
This Technical Session will start with a special lecture by the winner of the Michael Ashby Outstanding Materials Educator Award, Dr. Stephen Krause. This talk will be held from 11:30 a.m. - 12:00 p.m.
Measuring Student Learning of Crystal Structures Using Computer-based Visualizations
Dr. Susan P. Gentry, University of California, Davis
Dr. Tanya Fultens, Purdue University, West Lafayette
(Networl for Computational Nanotechnology)
William Ashwin Wheeler
Prof. Andre Schleife, University of Illinois at Urbana-Champaign
New Resources for Introduction to Materials Class
Mrs. Hannah Melia, Granta Design, Ltd.
Dr. Mike Ashby, University of Cambridge
Comparing Muddiest Points and Learning Outcomes for Campus and Distance Students in a Composite Materials Course
Dr. Matthew Cavalli, Western Michigan University
Use of Mixed Reality Tools in Introductory Materials Science Courses
Dr. Bilal Mansoor, Texas A&M University at Qatar
Mr. Mustapha Jamal Makki, Texas A&M University at Qatar
Dr. Dena Al-Thani, Hamad bin Khalifa University

M337 - Mathematics Division Technical Session 1
11:30 a.m. - 1:00 p.m., Room 255 F, Convention Center - Salt Palace
Sponsor: Mathematics Division
Moderator: William Fitzgibbon, University of Houston, College of Technology
Classifying the Engineering Mathematics Student: An Investigation of Trends in Learning
Dr. Paul L. Goethals, United States Military Academy
Karoline Hood, United States Military Academy
Engineering Majors’ Cognitive Function Differentiation Ability
Dr. Emre Tokgoz, Quinnipiac University
From Gateway to ‘Pathway’: Mentoring-the-Mentors to provide Academic and Motivational Support for Struggling STEM Majors
Dr. Nancy Romance, Florida Atlantic University
Dr. Ali Zilouchian, Florida Atlantic University
Dr. Michael Vitale, East Carolina University
Ms. Lisa Greenberg, Florida Atlantic University
Implementing the Wright State Model First-Year Engineering Mathematics Course in a Startup School of Engineering

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**Conference Sessions**

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**M338 - Mechanical Engineering Division Technical Session 11**

11:30 a.m. - 1:00 p.m., Room 155 C, Convention Center - Salt Palace  
**Sponsor:** Mechanical Engineering Division  
**Moderator:** Louis DiBerardino, Ohio Northern University

- Dr. Lynn A Albers, Campbell University  
  Motivation Building Strategies of Mathematics Instruction for Undergraduate Students in Mechanical Engineering  
  Dr. Amitabha Ghosh, Rochester Institute of Technology (COE)  
  Video Tutorials in Mathematics Education for Engineering Students  
  Ms. Franziska Dorothea Wehner, Technische Universität Darmstadt

**M339 - Dynamic Pedagogies for Engineering Dynamics**

11:30 a.m. - 1:00 p.m., Room 255 D, Convention Center - Salt Palace  
**Sponsor:** Mechanics Division  
**Moderator:** Geoffrey Recktenwald, Michigan State University

Papers that examine educational practices in the dynamics classroom.

- Evaluating the Usage and Value of Supplemental Materials in a Dynamics Class  
  Dr. William E. Howard, East Carolina University  
  Mr. Jeffrey R. Foeller, East Carolina University  
  Karen A. De Urquidi, East Carolina University  
  Incorporating IMU Technology to Demonstrate Concepts in Undergraduate Dynamics Courses

- Should Kinetics Follow Kinematics? Investigating Course Design in Dynamics  
  Dr. Phillip Cornwell, Rose-Hulman Institute of Technology  
  Lt. Col. Kent Ralph Jensen, USAF  
  Prof. Kwangjin Yang, United States Air Force Academy

**M340 - Minorities in Engineering Division Technical Session 1**

11:30 a.m. - 1:00 p.m., Room 255 B, Convention Center - Salt Palace  
**Sponsor:** Minorities in Engineering Division  
**Moderators:** Jeffrey Fergus, Auburn University; Richard Grimmett, Brigham Young University, Idaho

Curriculum and Faculty Development

- Tenure as a Closed System: Subconscious Behavioral Characteristics of Coercion, Groupthink, Bias and Inherent Discrimination  
  Dr. Mitchell L. Springer PMP, SPHR, SHRM-SCP, Purdue University, West Lafayette (College of Engineering)

- Work in Progress: Connections Between First-Order and Second-Order Dynamic Systems – Lessons in Limit Behavior  
  Dr. Vincent C. Prantil, Milwaukee School of Engineering  
  Dr. Mark L. Nagurka, Marquette University

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Exploring the Interplay of Diversity and Ethics in an Introductory Bioengineering Course (Work In Progress)
Dr. Dianne Grayce Hendricks, University of Washington
Camille Birch
Celina Gunnarsen
KickStarter: Providing Hispanic Serving Community Colleges with Technical Assistance to Improve their Federal Funding Competitiveness (Experience)
Ms. Cynthia Kay Pickering, Science Foundation Arizona
Caroline VanIngen-Dunn, Science Foundation Arizona
Ms. Anita Grierson, Science Foundation Arizona
Anna Tanguma, Science Foundation Arizona

M341 - Engaging Faculty Across Disciplines, Colleges, and Institutions
11:30 a.m. - 1:00 p.m., Room 253 A, Convention Center - Salt Palace
Sponsor: Multidisciplinary Engineering Division
Moderators: Jason Forsyth, York College of Pennsylvania; Koen Gieskes, Universal Instruments Corporation

Mechanical Engineering Design for Complex Environments: Incorporating Industrial Design Perspectives into a Multidisciplinary Capstone Design Project
Prof. Tom Weis, Rhode Island School of Design
Lt. Col. Harry Howard Jones IV
Drones and Satellites: Identifying Interdisciplinary Capstone Projects with Other Departments at Your Own University
Dr. Bruce E Dunne, Grand Valley State University
Paul Keenlance, Grand Valley State University
Architecture, Engineering, and Construction Interdisciplinary Senior Project Educational Model
Dr. Jinsung Cho, California State Polytechnic University Pomona
Dr. Giuseppe Lomiento, California State Polytechnic University Pomona
Dr. Gad M. Ghada, California State Polytechnic University, Pomona
Ms. Katrin Terstegen, Cal Poly Pomona

Innovation in the Course Disaster Risk Management to Improve the University Student’s Competence for Multidisciplinary and Participatory Work
Dr. Ing. Sandra Cecilia Santa Cruz, PUCP
Prof. Graciela del Carmen Fernández de Córdova, Pontificia Universidad Católica del Perú
Dr. Marta Vilela Vilela, Pontificia Universidad Católica del Perú
Multidisciplinary Research Efforts in Post-Earthquake Civil Infrastructure Reconnaissance
Mr. Jack Bergquist, California Polytechnic State University, San Luis Obispo
Dr. Anahid Behrouzi, California Polytechnic State University, San Luis Obispo

M344 - Ocean and Marine Division Technical Session 2
11:30 a.m. - 1:00 p.m., Room 151 E, Convention Center - Salt Palace
Sponsor: Ocean and Marine Division
Moderators: Shyam Aravamudhan, North Carolina A&T State University; Jennifer Michael, Old Dominion University

A Naval Hydrodynamics Undergraduate Curriculum for the Midwestern United States
Prof. James Buchholz, University of Iowa
Prof. Pablo M. Carrica, University of Iowa
Dr. Jae-Eun Russell, University of Iowa

Beyond the Sea Perch
Dr. Thomas R. Consi, Massachusetts Institute of Technology
Miss Jocelyn Frances Lorré, Massachusetts Institute of Technology
Ms. Michelle Kornberg, Massachusetts Institute of Technology
Design a Micro-wind and Solar Energy Harvesting System for a Wireless Sensor Node to Operate in Coastal and Marine Area as a Senior Design Project
Dr. Radian G. Belu, Southern University and A&M College
Dr. Richard Chiou, Drexel University
Prof. Lucian Ionel Cioca, Lucian Blaga University of Sibiu

M346 - Software Engineering Division Technical Session 1
11:30 a.m. - 1:00 p.m., Room 151 G, Convention Center - Salt Palace
Sponsor: Software Engineering Division
Moderator: Brad Dennis, Milwaukee School of Engineering

Analyzing Popularity of Software Testing Careers in Canada
Dr. Pradeep Kashinath Waychal, Western Michigan University
Prof. Luiz Fernando Capretz, Western University
Mr. Sachin Narendra Pardeshi, R.C. Patel Institute of Technology, Shirpur

The Use of HFOSS Projects in the Grace Hopper Celebration of Women in Computing Open Source Day
Dr. Cam Macdonell, MacEwan University
Heidi J.C. Ellis, Western New England University
Darci Burdge, Nassau Community College
Dr. Lori Postner, Nassau Community College
Dr. Gregory W Hislop, Drexel University (Computing and Informatics)

A Re-look at the Introduction to Software Engineering Course
Dr. James R Vallino, Rochester Institute of Technology (COE)
Mr. Bryan Basham, Software Alchemy (with RIT)

Why Educators Need to Team with Industry Professionals in Software Development Education
Dr. Gregory Kulczycki, Virginia Tech
Dr. Steven Atkinson, Virginia Tech

Schedule subject to change: Please go to www.asee.org/icp for up to date information
**M347 - Panel: Not a Graduate Student, but Not Yet a...: Navigating Transient Positions in Engineering Education**
11:30 a.m. - 1:00 p.m., Room 355 F, Convention Center - Salt Palace
Sponsor: Student Division
Moderators: Lilianny Virguez, University of Florida; Sreyoshi Bhaduri, Virginia Tech
Speakers: Dr. Cassandra J Groen, Virginia Tech; Dr. Glenda D. Young, Mississippi State University; Dr. Stephen Secules, University of Georgia; Mr. Benjamin David Lutz, Oregon State University

Traditional career pathways for doctoral graduates in STEM and related fields often meant immediately entering the promotion and tenure (P&T) pipeline after graduation. However, as the field of engineering education continues to grow, so too have the number and variety of positions for its graduates. Graduates of these programs are beginning to take more intermediate or transient positions as a means to hone their skills and develop professional foundations in preparation for the next phases of their careers—whether they are inside academia or not. While we have established career expectations and social roles for graduate students and new engineering education faculty, little is known about the tasks, roles, and responsibilities of recent graduates holding temporary positions such as postdoctoral researchers and visiting assistant professors. This lack of expectations or role clarity can make the transition out of graduate school a little more convoluted and a lot more confusing.

This panel session will consist of four panelists who have recently graduated from engineering education or STEM education doctoral programs and who now hold temporary positions at four different universities. In this session, panelists will offer a range of perspectives as they discuss expectations, experiences, challenges, accomplishments and lessons learned as they adjusted to new roles, built relationships with other researchers and colleagues, and became members of a new community of practice. The group will also discuss the creation and evolution of a weekly online peer mentoring group as a means to support one another through this transition.

**M348 - Systems Engineering Division Technical Session 3 – Course and Program Outcomes**
11:30 a.m. - 1:00 p.m., Room 260 B, Convention Center - Salt Palace
Sponsor: Systems Engineering Division
Moderator: Devanandham Henry, Regent University

Transitioning to the New ABET Student Outcomes: Architecture Development for a Systems Engineering Degree Program
- Dr. Stu Turner, U.S. Air Force Academy Systems Engineering
- Capt. Kalyn Tung, United States Air Force Academy
- Lt. Col. Cory Cooper, United States Air Force Academy

The Use of Systems Engineering Principles to Improve Learning Outcomes in a Multidisciplinary Course
- Dr. Zachary David Asher, Colorado State University
- Nicole L Ramo, Colorado State University

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**M351 - Women in Engineering Division Technical Session 7**
11:30 a.m. - 1:00 p.m., Room 257 A, Convention Center - Salt Palace
Sponsor: Women in Engineering Division
Moderator: Linda Thurman, University of North Carolina, Charlotte

A Systematic Literature Review on Improving Success of Women Engineering Students in the U.S.
- Dr. Pradeep Kashinath Waychal, Western Michigan University
- Dr. Charles Henderson, Western Michigan University
- Dr. Daniel Collier, Western Michigan University

Assessing Engineering Disciplines with Expected Success for Females in Saudi Arabia
- Dr. Ahmed M. El-Sherbeeny, King Saud University
- Dr. Hamed Dhafi Alsharari, Saudi Elecronic University

Building Skills in Engineering: Hand and Power Tool Workshops for Confidence and Retention
- Dr. Pamela L Dickrell, University of Florida

Valuing Women’s Contributions: Team Projects and Collaborative Writing
- Dr. Jennifer C Mallette, Boise State University
- Harold Ackler, Boise State University

**M355 - Best Practices - Approaches, Tips, and Techniques to Start, Grow, and Sustain an Engineering Leadership Development Program**
11:30 a.m. - 1:00 p.m., Room 155 F, Convention Center - Salt Palace
Sponsor: Engineering Leadership Development Division
Moderator: Andrew Erdman, Pennsylvania State University, University Park
Speakers: Dr. Doug Reeve, University of Toronto; Dr. Ebonee Williams, University of California, San Diego; Dr. Meg Handley, Pennsylvania State University, University Park; Dr. Meagan R. Kendall, University of Texas, El Paso; Leo McGonagle, Massachusetts Institute of Technology

As the need for engineering graduates with professional skills has become more widely recognized, Engineering Leadership Development (ELD) programs have been sprouting and expanding across the United States and Canada. The phenomenal growth of the ASEE Engineering Leadership Development (LEAD) programs have been sprouting and expanding across the United States and Canada. The phenomenal growth of the ASEE Engineering Leadership Development (LEAD) is clear evidence of the growing interest. This panel consists of leaders from several universities with a wide variety of highly successful ELD programs. Join the discussion to learn how these diverse programs developed, have grown, and how the lessons learned may be applied to help start your new programs or enhance your existing programs.
M396 - ASEE Profiles of Engineering and Engineering Technology Colleges Survey Focus Group and Data Task Force Meeting  
11:30 a.m. - 1:00 p.m., Room 250 A, Convention Center - Salt Palace  
**Sponsor: ASEE Headquarters**  
This session is organized by the ASEE Data Task Force, charged with developing recommendations to the board for the Profiles survey. In this session, the Data Task Force will spend the first 30 minutes or so organizing a focus group of profiles “super users” of the database to seek their feedback. The remaining time will be spent in a face-to-face meeting with the Data Task Force.

M401 - Panel Discussion  
1:30 p.m. - 3:00 p.m., Room 259, Convention Center - Salt Palace  
**Sponsor: Aerospace Division**  
**Moderator:** Sharan Asundi, Tuskegee University  
**Speakers:** Dr. Michael A. Swartwout, Saint Louis University, Parks College of Eng.; Dr. Norman G. Fitz-Coy, University of Florida  
This is a panel discussion on integrating aerospace engineering research and education at academic institutions.

M402 - Architectural Division Technical Session 1  
1:30 p.m. - 3:00 p.m., Room 151 C, Convention Center - Salt Palace  
**Sponsor: Architectural Division**  
**Moderator:** Gouranga Banik, Oklahoma State University  
- How Structures Move: Three Projects in Deployable Structures  
  Dr. Sudarshan Krishnan, University of Illinois, Urbana-Champaign  
  Ms. Yaxin Li, University of Illinois, Urbana-Champaign  
- Stellar’s Journey: From Conception to Prototyping of the Finalist in an International Design Competition  
  Prof. Bekir Kelceoglu, Syracuse University  
- A Comparative Study of an Architectural Design Course of Two Sections: The Course Impact on the Performance and Continuation of a Major-Assessment Based on Two Design Projects  
  Dr. Nibert Saltibus, Sam Houston State University

M403 - Biological and Agricultural Division Technical Session 1  
1:30 p.m. - 3:00 p.m., Room 254 A, Convention Center - Salt Palace  
**Sponsor: Biological and Agricultural Engineering Division**  
**Moderator:** Joel Peterson, University of Wisconsin, River Falls  
- Learning outcomes in BAE  
  A Comparison of Learning Outcomes and Learner Satisfaction in a CADD Course with Flexible and Rigid Deadlines  
  Dr. Joel Peterson P.E., University of Wisconsin, River Falls  
  Dr. Matthew Francis Digman, University of Wisconsin, River Falls  
- Work in Progress: Hybrid-flipped Classrooms: Challenges and Opportunities  
  Dr. D. Raj Raman, Iowa State University  
  Dr. Amy L. Kaleita, Iowa State University

M404 - Clinical Learning Experiences in BME  
1:30 p.m. - 3:00 p.m., Room 155 B, Convention Center - Salt Palace  
**Sponsor: Biomedical Engineering Division**  
**Moderators:** Daniel Cavanagh, Bucknell University; Joe Tranquillo, Bucknell University  
These presentations describe clinical immersion experiences and other clinical activities that have been incorporated into BME courses.

- Impact of Classroom Surgical Procedure Demonstration Using Artificial Bone in Orthopedic Implant Design  
  Dr. Won Joo, Robert Morris University  
- Designing an Interprofessional Educational Undergraduate Clinical Experience  
  Dr. Barbara Jean Muller-Borer, East Carolina University  
  Dr. Stephanie M. George, East Carolina University  
- Interdisciplinary Clinical Immersion: from Needs Identification to Concept Generation  
  Dr. Anthony E. Felder, University of Illinois, Chicago  
  Dr. Miirt Kotche, University of Illinois, Chicago  
  Prof. Susan Stirling, University of Illinois at Chicago  
  Prof. Kimberlee M Wilkens, University of Illinois at Chicago  
- The DMVP (Detect, Measure, Valuate, Propose) Method for Evaluating Identified Needs During a Clinical and Technology Transfer Immersion Program  
  Miss Hannah Lynn Cash, Clemson University  
  Dr. John D. DesJardins, Clemson University  
  Dr. Breanne Przestrzelski, University of San Diego

M406 - The Evolving Classroom  
1:30 p.m. - 3:00 p.m., Salon D, HQ Hotel - Marriott at City Creek  
**Sponsor: Civil Engineering Division**  
**Moderators:** Meg West, Ohio State University; Zhaoshuo Jiang, San Francisco State University  
An Institutional Excellence in Teaching Workshop Adapted from the ExCEEd Model  
- Dr. Charles Riley P.E., Oregon Institute of Technology  
- Dr. Sharon L. Beaudry, Oregon Institute of Technology  
- Aja Betencourt-McCarthy, Oregon Institute of Technology  
- Civil Engineering Students’ Views on Infrastructure in the U.S.  
  Dr. Carol Haden, Magnolia Consulting, LLC  
- Dr. Matthew W. Roberts, Southern Utah University  
- Developing an Effective and Engaging Concept-driven Approach to Teaching Structural Design  
  Dr. Joel Manning P.E., University of California, Irvine  
- Assessing the Influence of Lecture/Laboratory Instructor Pairings on Student Perception and Learning Outcomes  
  Dr. Simon Thomas Ghanat P.E., The Citadel  
  Dr. J. Michael Grayson, The Citadel  
  Dr. Monika Bubacz, The Citadel

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M407 - College Industry Partnerships Division Technical Session 3
1:30 p.m. - 3:00 p.m., Room 253 B, Convention Center - Salt Palace
Sponsor: College Industry Partnerships Division

Assembling a Successful Industry-sponsored Senior Capstone Program: Lessons Learned from a Startup Effort at a Liberal Arts University
Dr. Lori Houghtalen, Abilene Christian University
Dr. Timothy Kennedy P.E., Abilene Christian University
Mr. Raymond Earl Smith, Abilene Christian University
Case Study: Industry-sponsored Mechanical Engineering Capstone Senior Design Projects
Dr. Hosni L. Abu-Mulaweh, Purdue University, Fort Wayne
Nusaybah Abu-Mulaweh, Purdue University, West Lafayette
Statistical Methods Can Confirm Industry-sponsored University Design Project Results
Prof. Robert J. Durkin, Indiana University-Purdue University of Indianapolis
Dr. Paul Yearling P.E., Indiana University Purdue University, Indianapolis

M408 - COED: Gamification and Introducing Students to Programming
1:30 p.m. - 3:00 p.m., Room 255 E, Convention Center - Salt Palace
Sponsor: Computers in Education Division
Moderators: Erdogan Kaya, University of Nevada, Las Vegas; Anna Newley

Gamification and early introduction to to programming will be the topics of this session. Papers selected fit into one or both of these categories.

Using Gamification and Cyber Learning Environment to Improve Students’ Learning in an Introductory Computer Programming Course: An Empirical Case Study
Mrs. Mounya Reddy Narasareddy Gari, North Dakota State University
Dr. Gursimran Singh Walia, North Dakota State University
Mr. Alex Radermacher, North Dakota State University
From App Inventor to Java: Introducing Object-oriented Programming to Middle School Students Through Experiential Learning
Dr. Farzana Rahman, Florida International University
Second Year of Using the Sidekick Basic Kit for TI LaunchPad with

Elementary School Students
Ms. Taria N. Kimney, Colorado STEM Academy
Dr. Cameron H. G. Wright P.E., University of Wyoming
Dr. Thad B. Welch, Boise State University
Incorporating Diegetic Elements to Increase Engagement in Games for Engineering Education
Ms. Katherine Smith, Old Dominion University
Prof. Yuzhong Shen, Old Dominion University
Dr. Anthony W. Dean, Old Dominion University

M408B - COED Modulus Topics
1:30 p.m. - 3:00 p.m., Room 355 D, Convention Center - Salt Palace
Sponsor: Computers in Education Division

In computing, the modulus operator stands for remainder. This session will highlight some of the papers that simply did not fit into the themes of the other technical sessions.

Developing Reviewer Profiles Using Analysis of Prior Authorship
Dr. Matthew A. Verleger, Embry-Riddle Aeronautical University

Enabling Advanced Topics in Computing and Engineering Through Authentic Inquiry: A Cybersecurity Case Study
Dr. Mike Borowczak, University of Wyoming
Dr. Andrea Carneal Burrows, University of Wyoming
Undergraduate Research: Adaptation and Evaluation of Software-defined Radio-based Laboratories
Dr. Deng Cao, Central State University
Dr. Zhiqiang Wu, Wright State University
Prof. Bin Wang, Wright State University
Prof. Chi-Hao Cheng, Miami University

A Hybrid Google Computer Science for High School Workshops
Dr. Afrin Naz, West Virginia University
Dr. Mingyu Lu, West Virginia University
Jordan Bowen, West Virginia University
Mr. Cody Ryan Zackoski

M409 - Construction Division Technical Session 2: K-12 through Adult Learning
1:30 p.m. - 3:00 p.m., Room 257 A, Convention Center - Salt Palace
Sponsor: Construction Engineering Division
Moderators: Gouranga Banik, Oklahoma State University; Saeed Rokooei, Mississippi State University

Increasing Student Construction Interest by Engaging Elementary Students in an Inquiry-Based 3D Modelling After School Program
Dr. Geoff Wright, Brigham Young University
Dr. Justin Earl Weidman, Brigham Young University
Student Perception as a Planning Input in a Project-Based Construction Program
Dr. Saeed Rokooei, Mississippi State University
The Use of Peer Teaching Quality Managers to Improve Student Learning in a Construction Project Management Course
Dr. Anthony Torres, Texas State University
Dr. Vedaraman Sriaraman, Texas State University
Dr. Araceli Martinez Ortiz, Texas State University

Schedule subject to change: Please go to www.asee.org/icp for up to date information
Conference Sessions

Ms. Kristin Marie Kibling, Texas State University
Tailoring Construction Management Instruction to the Emerging Adult Learner
Dr. Robert B. Austin, Bowling Green State University

M4102 - EDC Public Policy Committee Meeting
(By Invitation Only)
1:30 p.m. - 3:00 p.m., Salon B, HQ Hotel - Marriott at City Creek
Sponsor: Engineering Deans Council
Meeting of the Engineering Deans Council (EDC) Public Policy Committee members.

M4104 - ETC Executive Board Meeting
1:30 p.m. - 3:00 p.m., Room 250 B, Convention Center - Salt Palace
Sponsor: Engineering Technology Council
Engineering Technology Council executive business meeting.

M4109A - Sponsor Technical Session: The Engineering Behind TI’s Educational Robot—Presented by Texas Instruments
1:30 p.m. - 3:00 p.m., Room 150 A - Sponsor Tech Room, Convention Center - Salt Palace
Sponsor: Sponsored Sessions
Come and see the engineering inside TI-Innovator Rover™, the educational robotic vehicle that helps students to explore topics in math, science, engineering, and technology using coding. We will do hands-on activities with Rover and explore the subsystems—encoders, gyroscope, motor driver, and sensors—that keep Rover rolling. We will also discuss the engineering decisions and the hardware/software interactions that were part of the design process. Presenters: Brian Dunnicliffe, Texas Instruments; and Harshal Chhaya, Texas Instruments
Snacks will be provided.

M4109B - Sponsor Technical Session: Presented by the University of Maryland
1:30 p.m. - 3:00 p.m., Room 150 B - Sponsor Tech Room, Convention Center - Salt Palace
Sponsor: Sponsored Sessions
This session will feature ways to create an environment that fosters student competitions, risk-taking, and creativity.

M411 - Postcard Session: Experiential Learning as a High-Impact Student Experience
1:30 p.m. - 3:00 p.m., Salon H, HQ Hotel - Marriott at City Creek
Sponsor: Cooperative and Experiential Education Division
Moderators: Lisa Massi, University of Central Florida; Diane LaFreniere, Grand Valley State University
Free ticketed event
Increasing Student Self-Efficacy through Undergraduate Research Experiences: A Qualitative Study
Addison J. Litton, Utah State University

Dr. Wade H. Goodridge, Utah State University
Mr. Benjamin James Call, Utah State University
Sarah E. Lopez, Utah State University
Summer Exchange Program: A Unique Platform to Broaden Exposure and Address Several Dimensions of Learning
Dr. Abhijit Nagchandakuri, University of Maryland, Eastern Shore
Dr. Lei Zhang, University of Maryland, Eastern Shore
Dr. Madhumi Mitra Ph.D., University of Maryland, Eastern Shore
Mr. Blake Prout, University of Maryland, Baltimore County
Mohsin Mehmood
Ms. Kalah A. Cross, Morgan State University
Dr. Matt Collinge, Johns Hopkins University
Mr. Hafeez Temiotepe Shittu,
Mr. Habilou Ouro-Koura, University of Maryland, Eastern Shore
Intensive Mentoring and Micro-Electronics Research for Students in Engineering (IMMERSE)
Prof. Stephen Schultz, Brigham Young University
Prof. Aaron R. Hawkins, Brigham Young University
Establishing an Industrial Engineering Internship Pipeline for Data Analysis Careers in Collegiate and Professional Athletics
Dr. Glenda D. Young, Mississippi State University
Dr. Reuben F. Burch V, Mississippi State University

M4112 - Action on Diversity - Best Diversity Paper Finalists
1:30 p.m. - 3:00 p.m., Room 150 E, Convention Center - Salt Palace
Sponsors: ASEE Diversity Committee; International Division
Moderator: Susan Walden, University of Oklahoma
Speakers: Mr. Eric Specking, University of Arkansas; Mr. Sean Eddington; Abisola Coretta Kusimo; Dr. Jennifer A Gatz; Prof. Jonathan D. Stolk, Franklin W. Olin College of Engineering; Ms. Brianna Benedict
The top nominees for the Best Diversity Paper award will present their papers here (as well as in their home divisions). The award will be based on both the papers and the presentations during this session. The finalist papers for 2018 are:
*23863 "Diversity and Inclusion in Electrical and Computer Engineering: Students’ Perceptions of Learning and Engaging with Difference” – Sean Eddington, Carla B. Zoltowski, Andrew O. Brightman, Rucha Joshi, Patrice Marie Buzzanell, and David Torres, all of Purdue University
*23814 "Effects of Research and Internship Experiences in Engineering Task Self-efficacy on Engineering Students through an Intersectional Lens” – Abisola Kusimo, Marissa Thompson, and Sheri Sheppard of Stanford University, and Sara Atwood of Elizabethtown College
*22003  "The Power of Peer Mentoring of Undergraduate Women in Engineering: Fostering Persistence through Academic and Social Integration” – Jennifer A Gatz, Dr. Angela M Kelly, and Dr. Monica Bugallo, all of Stony Brook University
*22784 "Gender, Motivation, and Pedagogy in the STEM Classroom:
Conference Sessions

M4113 - Undergraduate Experience Committee: Enrollment Trends and Admit Criteria
1:30 p.m. - 3:00 p.m., Room 151 A, Convention Center - Salt Palace
Sponsor: Undergraduate Experience Committee
Moderators: Jerome Lavelle, North Carolina State University; Lynne Molter, Swarthmore College
This session will explore issues related to admissions and enrollment trends in undergraduate engineering education. Format is interactive and includes discussion of intended and unintended impacts within each sphere.

M413 - Teamwork and Student Learning in Design
1:30 p.m. - 3:00 p.m., Room 253 A, Convention Center - Salt Palace
Sponsor: Design in Engineering Education Division
Capstone Design and Psychology: Teams, Traits, and Competencies Measured in Student Surveys
- Dr. Kimberly B. Demore P.E., Florida Institute of Technology
- Kyi Phyu Nyin, Florida Institute of Technology
- Dr. Jessica L. Wildman, Florida Institute of Technology
A Longitudinal Study Exploring Motivation Factors in Cornerstone and Capstone Design Courses
- Elisabeth Kames, Florida Institute of Technology
- Miss Devanshi Dhirenkumar Shah, Florida Institute of Technology
- Dr. Beshoy Morkos, Florida Institute of Technology
CATME or ITP Metrics? Which One Should I Use for Design Team Development and Assessment?
- Prof. Marnie V. Jamieson, University of Alberta
- Dr. John M. Shaw, University of Alberta
Building Engineering Professional and Teamwork Skills: A Workshop on Giving and Receiving Feedback
- Ms. Erin Jobidon, University of Waterloo
- Ms. Maria Barichello, University of Waterloo
- Dr. Rania Al-Hammoud P.Eng., University of Waterloo
- Mehrnaz Mostafapour, University of Waterloo
- Mr. Christopher Rennick, University of Waterloo
- Dr. Ada Hurst, University of Waterloo
- Dr. Jason Grove P.E., University of Waterloo
Academic Practice/Design Interventions: An Activity-Based Design Course for Conceptualizing Failure and Factor of Safety
- Mr. Nikolaos E. Vitoroulis Jr, Stevens Institute of Technology

Monday, June 25

M414A - Works in Progress I
1:30 p.m. - 3:00 p.m., Salon E, HQ Hotel - Marriott at City Creek
Sponsor: Educational Research and Methods Division
Moderators: Archie Holmes, University of Virginia; Jeffrey Froyd, Ohio State University
Educational Research and Methods Division Technical Session
Work in Progress: A Case for Disaggregating Demographic Data
- Mr. Matthew Bahnson, North Carolina State University
- Heather Lee Perkins, North Carolina State University
- Mrs. Marissa A. Tsagawa-Nieves, University of Nevada, Reno
- Dr. Adam Kirn, University of Nevada, Reno
- Dr. Cheryl Cass, North Carolina State University
Work in Progress: Teaching Engineering Students How the Brain Works to Encourage Positive Learning Dispositions and Behaviors
- Dong San Choi, University of Illinois, Urbana-Champaign
- Prof. Michael C. Loui, Purdue University, West Lafayette (College of Engineering)
- Work in Progress: Characterizing Conceptual Change about Moments in a Statics Course
- Dr. Chris Venters, East Carolina University
- Ms. Katie Brown
- Work in Progress: How Do Visual Representations Affect How Engineering Students Learn and Solve Problems Within and Across Disciplines?
- Ms. Nicole Johnson-Glauch, Dong San Choi, University of Illinois, Urbana-Champaign
- Dr. Geoffrey L. Herman, University of Illinois, Urbana-Champaign
- Work in Progress: Emergence of Shared Leadership Dynamics during Engineering Student Design Projects
- Dr. Malini Natarajarathinum, Texas A&M University
- Ms. Katie Brown
- WIP: Decoding a Discipline – Toward Identifying Threshold Concepts in Geomatics Engineering
- Dr. Ivan Detchev, University of Calgary
- Dr. Elena V. Rangelova, University of Calgary
- Mr. Scott C. Packer, University of Calgary
- WIP: Threshold Concepts in Geomatics Engineering
- Dr. Chris Veniter, East Carolina University
- Ms. Katie Brown

M414B - Design Thinking and Creativity
1:30 p.m. - 3:00 p.m., Room 255 D, Convention Center - Salt Palace
Technology
- Mr. Changhong Zhang
- Dr. Kishore Pochiraju, Stevens Institute of Technology
Exploration of Multi-layered Mentorship Approaches in Summer Engineering Programs
- Prof. Kimberly Cook-Chennault, Rutgers, the State University of New Jersey


**Monday, June 25**

**Conference Sessions**

**M415A - ECE Panel Session: Revolutionizing Electrical and Computer Engineering Departments**

1:30 p.m. - 3:00 p.m., Room 355 F, Convention Center - Salt Palace

**Sponsor:** Electrical and Computer Division

**Moderator:** Diane Rover, Iowa State University

**Speakers:** Dr. Anthony A. Maciejewski, Colorado State University; Dr. Diane T. Rover, Iowa State University; Dr. Mani Mina, Iowa State University; Dr. Nicholas D. Fila, Iowa State University; Dr. Luke Lester, Virginia Tech; Prof. Thomas Martin, Virginia Tech

Tony Maciejewski, Colorado State University; Diane Rover, Mani Mina, and Nick Fila, Iowa State University; and Luke Lester and Tom Martin, Virginia Tech

Session contact: Diane Rover

In 2015, the National Science Foundation (NSF) awarded the first grants in the REvolutionizing engineering and computer science Departments (RED) program. The goals of the RED program as stated by NSF are to “enable engineering and computer science departments to lead the nation by successfully achieving significant sustainable changes necessary to overcome longstanding issues in their undergraduate programs and educate inclusive communities of engineering and computer science students prepared to solve 21st-century challenges.” Three rounds of awards were made for a total of 19 department grantees. Three electrical and computer engineering (ECE) departments have been awarded RED grants: Colorado State University (2015), Iowa State University (2016), and Virginia Tech (2016).

The RED project at Colorado State is titled “Revolutionizing Roles to Re-imagine Integrated Systems of Engineering Formation.” The fundamental premise is that a department should take a holistic view of and collective responsibility for the educational experience. Iowa State’s RED project is titled “Reinventing the Instructional and Departmental Enterprise to Advance the Professional Formation of Electrical and Computer Engineers.” The change process is being driven by a cross-functional, collaborative instructional model for course design, called X-teams. The RED project at Virginia Tech is titled “Radically Re-designing the Fan-in and Fan-out of an Electrical and Computer Engineering Department.” It aims to transform the offerings of a traditional engineering department with a new curriculum model that emphasizes design and innovation approaches.

At the 2017 ASEE Annual Conference, the RED ECE departments co-led a special session for the ECE Division introducing attendees to their projects. The session was well-attended with substantial interaction. We propose a special session that will build on the first session, informing attendees about the latest activities and results and engaging them in discussion. The session will focus on two emphases of the RED program:

1) change processes underway in the departments, and the associated opportunities and challenges for faculty, students and curricula; and

2) professional formation of electrical and computer engineering students.

The organizers will involve the attendees using a collective inquiry approach to explore these issues through their perspectives, experiences and reflections.

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**M415B - Electrical and Computer Division Technical Session 2**

1:30 p.m. - 3:00 p.m., Room 250 F, Convention Center - Salt Palace

**Sponsor:** Electrical and Computer Division

**Moderator:** Renee Clark, University of Pittsburgh

Student-centered and Teacher-friendly Formative Assessment in Engineering

- Dr. Cynthia Furse, University of Utah
- Dr. Donna Harp, Zentigens, University of Utah

Using Guidelines from Cognitive Load Theory for the Traditional/ Online Flipped Classroom Approach

- Prof. John M. Santiago Jr., Colorado Technical University
- Dr. Jing Guo, Colorado Technical University

The Use of SPICE Simulation to Promote Reflection and Metacognition in a Microelectronics Course

- Dr. Renee M. Clark, University of Pittsburgh

Schedule subject to change: Please go to [www.asee.org/icp](http://www.asee.org/icp) for up to date information
Monday, June 25

Conference Sessions

M416 - Energy Conversion and Conservation Division Best Papers
1:30 p.m. - 3:00 p.m., Room 255 A, Convention Center - Salt Palace
Sponsor: Energy Conversion and Conservation Division
Moderators: S. Mousavinezhad, Idaho State University; Teodora Shuman, Seattle University

Integrated Learning In Context for Heat Exchanger Analysis
Dr. Jan T. Lugowski, Purdue University, West Lafayette
Prof. William Hutzel, Purdue University, West Lafayette
Design and Implementation of MATLAB-Simulink Based Solar Cell Modeling and PV System Design Exercises for Advanced Student Learning
Dr. Sandip Das, Kennesaw State University
Teaching Power Circuit Breaker Testing to Undergraduates
Dr. Glenn T. Wrate P.E., Northern Michigan University
Improving Vertical Axis Wind Turbine (VAWT) Performance
Dr. Patrick A. Tebbe, Minnesota State University, Mankato
Dr. Nazli Aslican Yilmaz Wodzinski, Minnesota State University, Mankato
Dr. Namyong Lee, Minnesota State University, Mankato

M417 - Engineering and Public Policy Division Technical Session 1
1:30 p.m. - 3:00 p.m., Room 260 A, Convention Center - Salt Palace
Sponsor: Engineering and Public Policy Division
Moderators: Daniel Oerther, Missouri University of Science & Technology; Deanna Matthews, Carnegie Mellon University

Assessing and Enhancing Standards Education for Environmental Management and Sustainability
Dr. Deanna H. Matthews, Carnegie Mellon University
Prof. H. Scott Matthews, Carnegie Mellon University
Attacks on Tenure: An Engineering Professor’s Experiences with Public Policy Actions Impacting Higher Education
Dr. John R. Reisel, University of Wisconsin, Milwaukee
Learning from Failures: Engineering Education in an Age of Academic Capitalism
Mr. Andrew Katz, Purdue University, West Lafayette
Dr. Donna M. Riley, Purdue University, West Lafayette
Using a Grounded Theory to Determine the Motivational Factors of Engineers’ Participation in Public Policy
Mrs. Sarah Bouazzaouisi, Old Dominion University
Mr. Charles B. Daniels, Old Dominion University

M418 - EDGD Business Meeting
1:30 p.m. - 3:00 p.m., Room 250 C, Convention Center - Salt Palace
Sponsor: Engineering Design Graphics Division
Semi-Annual Business Meeting of the Engineering Design Graphics Division. This meeting is open to all ASEE members.

M420 - Engineering Ethics Division Technical Session 5
1:30 p.m. - 3:00 p.m., Room 155 F, Convention Center - Salt Palace
Sponsor: Engineering Ethics Division
Moderators: Justin Hess, Indiana University Purdue University, Indianapolis; Ellen Zegura, Georgia Institute of Technology

An Introduction to the Integrated Community-Engaged Learning and Ethical Reflection Framework (I-CELER)
Mr. Grant A. Fore, Indiana University-Purdue University of Indianapolis
Dr. Justin L. Hess, Indiana University-Purdue University of Indianapolis
Dr. Brandon Sorge, Indiana University-Purdue University of Indianapolis
Dr. Mary F. Price, Indiana University-Purdue University of Indianapolis
Martin A. Coleman, Indiana University-Purdue University of Indianapolis
Mr. Thomas William Hahn, Indiana University-Purdue University of Indianapolis
Dr. Julie Adele Hatcher

Incorporating Ethics Education into an Electrical and Computer Engineering Undergraduate Program
Ms. Mahsa Ghorbani, Colorado State University
Dr. Anthony A. Maciejewski, Colorado State University
Dr. Thomas J. Siller, Colorado State University
Prof. Edwin K. P. Chong Ph.D., Colorado State University
Dr. Pinar Omur-Ozbek, Colorado State University
Dr. Rebecca A. Atadero, Colorado State University

Undergraduate STEM Students and Community Engagement Activities: Initial Findings from an Assessment of Their Concern for Public Well-being
Alexandra Erwin
Dr. Jason Borenstein, Georgia Institute of Technology
Dr. Wendy C. Newsstetter, Georgia Institute of Technology
Prof. Colin Potts, Georgia Institute of Technology
Ellen Zegura, Georgia Institute of Technology

IT Ethics and the Role of Perceived Possibility of Disclosure: An Interventional Research
Dr. Alireza Bolhari, Islamic Azad University, Tehran
Dr. Azadeh Bolhari, Angelo State University

The Ethical Judgement Processes of Students in Computing:
Dr. Azadeh Bolhari, Angelo State University

Schedule subject to change: Please go to www.asee.org/icp for up to date information
Implications for Professional Development
Mr. Amir Hedayati Mehdiabadi, University of Illinois, Urbana-Champaign

**M423 - MET Department Heads Meeting**
1:30 p.m. - 3:00 p.m., Room 250 E, Convention Center - Salt Palace
**Sponsor: Engineering Technology Division**
Annual Business Meeting

**M425 - Environmental Engineering Division Technical Session 3**
1:30 p.m. - 3:00 p.m., Room 355 C, Convention Center - Salt Palace
**Sponsor: Environmental Engineering Division**
Moderator: Fethiye Ozis, Northern Arizona University

International Scientific Research Experiences: Developing Global Citizens and Nurturing Engineers and Scientists of the Future
Dr. Bettina Jeanine Casad, University of Missouri, St. Louis
Dr. Monica Palomo P.E., California State Polytechnic University, Pomona
Dr. Natalie Mladenov, San Diego State University

Introduction to Public Health for Environmental Engineers: Results from a Three-year Pilot
Dr. Daniel B. Oerther, Missouri University of Science & Technology

Learning Benefits of Integrating Socioeconomic and Cultural Considerations into an Onsite Water Reclamation Course Project
Lt. Col. Andrew Ross Pfluger, Colorado School of Mines
Dr. Gary Vanzin
Dr. Robert L. Siegrist, Colorado School of Mines

**M426 - Division for Experimentation & Laboratory-Oriented Studies Technical Session 1**
1:30 p.m. - 3:00 p.m., Room 254 C, Convention Center - Salt Palace
**Sponsor: Experimentation and Laboratory-Oriented Studies Division**
Moderator: Michael Golub, Indiana University Purdue University, Indianapolis

Laboratory and experiential topics.

  Prof. Gene L. Harding, Purdue Polytechnic Institute
  Dr. Megan Prygoski, Purdue University, West Lafayette
  Dr. James Burns, Purdue Polytechnic Institute
  Mr. Brian Jeffrey Carmichael, Security Automation Systems
  Matthew S. Engstrom, Purdue University

- A Cost-effective Laboratory Setup for Teaching System Dynamics and Controls
  Dr. Pavan K. Karra, Trine University

- A Hands-on Project for Avionics Systems Course in Aviation
  Prof. Mary E. Johnson Ph.D., Purdue Polytechnic Institute
  Prof. Thomas Eismin, Purdue University

**M427A - First-year Programs Division: Student Success**
1:30 p.m. - 3:00 p.m., Salon J, HQ Hotel - Marriott at City Creek
**Sponsor: First-Year Programs Division**
Moderators: Jon Sticklen, Michigan Technological University; Ruth Wertz, Valparaiso University

Five evidence-based practice papers related to student success, including summer programs.

- Engineering Technology Program
  Dr. Chenyu Huang, Purdue University
  Prof. Mary E. Johnson Ph.D., Purdue Polytechnic Institute
  Prof. Thomas Eismin, Purdue University
  Enhancing a Real-time Audio Laboratory Using the MATLAB Audio System Toolbox
  Mr. Kip D. Coonley, Duke University
  Mr. Gautam Sai Chebrolu, Duke University
  Estimation of Experimental Errors Using Monte Carlo Analysis in the Introductory Electrical Circuits Laboratory
  Dr. Shaghayegh Abbasi, University of San Diego
  Dr. Ernest M. Kim, University of San Diego
  Dr. Thomas F. Schubert Jr. P.E., University of San Diego
  Optimizing Students’ Learning Experiences in Instrumentation and Measurement Laboratory
  Dr. Emine Celik Foust, York College of Pennsylvania

- Summer Engineering Academy for First-year Students in STEM: Making the Transition to College Through Coding and Robotics
  Dr. Okan Caglayan, University of the Incarnate Word
  Dr. Sreedevi Ande P.E., University of the Incarnate Word
  Mr. Erik Coronado
  Mr. Samuel Jacob Handowski

- Engineering Boot Camp: An Intense, Transformative Program for Incoming Freshmen
  Dr. Ann-Marie Vollstedt, University of Nevada, Reno
  Dr. Hossein Rahemi, Vaughn College of Aeronautics & Technology
  Dr. Amir Elzawawy, Vaughn College of Aeronautics & Technology
  Prof. Khalid Mouaouya, Vaughn College of Aeronautics & Technology
  Supporting Student Learning Through Peer-led Course Support Initiatives
  Jenai Kelley Brown, Clemson University
  Natalie Stringer, Clemson University
  Dr. Rachel K. Anderson, Clemson University
  Laurel Whisler, Clemson University
  Examining the Effectiveness of Scholars Assisting Scholars Among Undergraduate Engineering Students

Schedule subject to change: Please go to www.asee.org/icp for up to date information
Conference Sessions

Monday, June 25

1:30 p.m. - 3:00 p.m., Room 150 G, Convention Center - Salt Palace

Sponsor: Graduate Studies Division
Moderator: Eric Holloway, Purdue University-Main Campus, West Lafayette (College of Engineering)

Papers related to the development of professional skills in engineering graduate students.

‘I Came in Thinking There Was One Right Practice’: Exploring How to Help Graduate Students Learn to Read Academic Research
Wendy Roldan, University of Washington
Dr. Jennifer A. Turns, University of Washington

An Approach to Teaching Academic Writing to International Graduate Students in Colleges of Engineering
Ms. Kate Caroline Batson, University of Mississippi
Promoting an Inclusive Culture: Outcomes from Active Bystander Training
Dr. La’Tonya Stiner-Jones, Ohio State University
Providing Sustainable Scientific Writing Support for Graduate Engineering Students by Creating a Local Scientific Learning Community
Mr. Prasun Lala, École de Technologie Supérieure
Dr. Félix Langevin Harnois, École de Technologie Supérieure
Dr. Ghizlane El Boussaidi, École de Technologie Supérieure

Review of Global Trends in Knowledge, Skills, and Abilities (KSA) Frameworks Applicable to Ph.D. Programs in Engineering
Mr. Eric Holloway, Purdue University, West Lafayette
Prof. David F. Radcliffe, Swinburne University of Technology

Conference Sessions

Dr. Lydia Yang Yang, Kansas State University
Dr. Bette Grauer P.E., Kansas State University

M427B - First-year Programs Division: Online Learning
1:30 p.m. - 3:00 p.m., Room 257 B, Convention Center - Salt Palace

Sponsor: First-Year Programs Division
Moderators: Jack Bringardner, NYU
Tandon School of Engineering; Katrina Rothrock, University of Kansas, Edward Campus

Five full papers will be presented that relate to online learning (flipped classroom, blended classroom, MOOCs).

Motivating Students to Learn a Programming Language: Applying a Second Language Acquisition Approach in a Blended Learning Environment
Dr. Lulu Sun, Embry-Riddle Aeronautical University
Dr. Christina Frederick, Embry-Riddle Aeronautical University
Prof. Caroline Liron, Embry-Riddle Aeronautical University
Dr. Li Ding, Dr. Lei Gu, Georgia State University
Mr. Andrew Calvin Griggs II, Embry-Riddle Aeronautical University
Paula Sanjuan Espejo, Embry-Riddle Aeronautical University
Paula Sanjuan Espejo, Embry-Riddle Aeronautical University

Evidence-based Best Practices for First-year Blended Learning Implementation
Ms. Emily Ann Marasco, University of Calgary
Dr. Mohammad Moshirpour, University of Calgary
Dr. Mahmood Moussavi, University of Calgary
Prof. Laleh Behjat P.Eng., University of Calgary
Yasaman Amannejad, University of Calgary

A Comparison of Students Learning Programming with Online Modules, Instruction, and Team Activities
Dr. Jacqueline C. McNeil, University of Louisville
Dr. Angela Thompson P.E., University of Louisville
Nicholas Hawkins, University of Louisville

(PREP)ARE: A Student-centered Approach to Provide Scaffolding in a Flipped Classroom Environment
Dr. Sarah Jane Grigg, Clemson University
Dr. Elizabeth Anne Stephan, Clemson University

Development and Implementation of a MOOC Introduction to Engineering Course
Dr. Benjamin Emery Mertz, Arizona State University
Dr. Haolin Zhu, Arizona State University
Amy Trowbridge, Arizona State University
Mrs. Alicia Baumann, Arizona State University

M428 - Professional Skills for Graduate Students

Schedule subject to change: Please go to www.asee.org/icp for up to date information

Monday
Conference Sessions

**Monday, June 25**

**Monday Conference Sessions**

- Miss Mangaya Sivagnanam, Ingersoll Rand
- Dr. Faisal Kaleem, Metropolitan State University
- Short-format Workshops Build Skills and Confidence for Researchers to Work with Data
  - Kari L. Jordan Ph.D., The Carpentries
  - Marianne Corvellec, Institute for Globally Distributed Open Research and Education (IGDORE)
  - Elizabeth D. Wickes, University of Illinois at Urbana-Champaign
  - Dr. Naupaka B. Zimmerman, University of San Francisco
  - Mr. Jonah M. Duckles, Software Carpentry
  - Tracy K. Teal, The Carpentries

**M430B - Computing Technology Applications-I**
1:30 p.m. - 3:00 p.m., Room 151 B, Convention Center - Salt Palace

**Sponsor:** Computing and Information Technology Division

**Moderators:** Zhen Wu; Raja Kushalnagar, Rochester Institute of Technology (GCCCIS)

- **Teaching Directory Services: Topics, Challenges, and Experiences**
  - Dr. Yu Cai, Michigan Technological University

- **Expanding the Pool of Undergraduate Computing Students: Increasing Enrollments by Strategically Recruiting Women**
  - Dr. Zhen Wu, University of Colorado, Boulder
  - Dr. Christopher Lynnly Hovey, University of Colorado, Boulder
  - Dr. Leisa Thompson, University of Virginia

- **RTTD-ID: Tracked Captions with Multiple Speakers for Deaf Students**
  - Dr. Raja S. Kushalnagar, Gallaudet University
  - Mr. Gary W. Behm, Rochester Institute of Technology
  - Mr. Peter Yeung
  - Miss Becca Dingman
  - Mr. Shareef Sayel Ali, Center on Access Technology
  - Mr. Abraham Glasser, Rochester Institute of Technology

- **Teaching Theoretical Computer Science and Mathematical Techniques to Diverse Undergraduate Student Populations**
  - Dr. Predrag T. Tosic, University of Idaho
  - Dr. Julie Beeston, University of Idaho

**M431 - Instrumentation Division Technical Session 1**
1:30 p.m. - 3:00 p.m., Room 151 G, Convention Center - Salt Palace

**Sponsor:** Instrumentation Division

**Moderators:** Ali Alavizadeh, Purdue University Northwest; Masoud Fathizadeh, Purdue University Northwest

- **Virtual Software and Hardware Environment Provides Enhanced Learning for Mechatronics Engineering Technology Majors**
  - Prof. Akram Hossain, Purdue University Northwest
  - Dr. Mohammad A. Zahraee, Purdue University Northwest

- **Students’ Participation to Improve Formula SAE Car**

**M432 - Humanitarian and Sustainability in a Global Engineering Context**
1:30 p.m. - 3:00 p.m., Room 355 A, Convention Center - Salt Palace

**Sponsor:** International Division

**Moderators:** Vinod Lohani, Virginia Tech; Renetta Tull, University of Maryland, Baltimore County

- **The papers in this session address programs dealing with humanitarian and sustainability foci in an international context.**

    - Dr. Michael F. MacCarthy, Mercer University
    - Holly F. Berns, Mercer University
    - Mr. Ryan Monty, United Nations Humanitarian Response Depot
    - Miss Mitzi Erin Brett
    - Mr. Zachary Lewis Martin
    - Ms. Katelyn C.N. Dimopoulos, Mercer University

  - **Impact of Sustainable Study Abroad Course on Students**
    - Prof. Patricia Fox, Indiana University-Purdue University of Indianapolis
    - Dr. Charles McIntyre, Indiana University-Purdue University of Indianapolis
    - Dr. Brandon Sorge, Indiana University-Purdue University of Indianapolis

  - **International Perspectives on Intersecting Engineering’s Grand Challenges and the UN’s Sustainable Development Goals**
    - Dr. Christina Kay White, Massachusetts Institute of Technology
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Schedule of Events

Breakfast Faculty Panel
Tuesday, June 26, 2018
8:00am-9:30am
Room 150 C
Convention Center - Salt Palace

The Textbook Evolution
Join McGraw-Hill Education for an insightful panel discussion with engineering faculty members who will discuss the evolution of the classroom experience, revealing how they deliver a rich, active-learning experience for engineering students.

Panel Discussion
Tuesday, June 26, 2018
3:15pm-4:45pm
Room 150 C
Convention Center - Salt Palace

Design Your Ideal Teaching Experience
Every person defines their ideal teaching experience differently. So, what matters to you? Curriculum and course design? Student engagement? Personalized learning? Outcomes? Or, something else? Hear from educators and students who are working towards their ideal experience using McGraw-Hill's Connect© to unlock their full potential.

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Monday, June 25

Conference Sessions

Technology
Dr. Renetta G. Tull, University of Maryland, Baltimore County
Dr. Yevgeniya V. Zastavker, Franklin W. Olin College of Engineering
Ms. Rovani Sigamoney, UNESCO

Cross-cultural Collaboration Inspired by a Sustainable Building Course in Costa Rica
Dr. Rodolfo Valdes-Vasquez, Colorado State University
Dr. Caroline Murrie Clevenger
Laura Thornes
Dr. Svetlana Olbina

Developing Humanitarian Engineering Perspectives Among Underrepresented Scholars Through Engagement with the Sustainable Development Goals in Global Contexts
Dr. Renetta G. Tull, University of Maryland, Baltimore County
Ms. Shawnisha Hester, University of Maryland, Baltimore County
Mrs. Yarazeth Medina, University of Maryland, Baltimore County
Ms. Denise Nicole Williams, University of Maryland, Baltimore County
Hector Medina, University of Maryland, Baltimore County
Ms. Erika T. Aparaka, University of Maryland College Park

Engineering Education for Sustainable Development and Global Citizenship: A Course-level Implementation Case in Hong Kong
Dr. Rosanna Yuen-Yan Chan, Chinese University of Hong Kong
Prof. Cecilia KY Chan, University of Hong Kong
Mr. Mehrdad Tahernia, Chinese University of Hong Kong
Mr. Jiaxin Liang, University of Texas, El Paso
Mr. Qi Cao, Chinese University of Hong Kong

M434 - Panel: Embedding Writing in Experiential Learning
1:30 p.m. - 3:00 p.m., Room 255 F, Convention Center - Salt Palace
Sponsor: Liberal Education/Engineering & Society Division
Moderator: Lindsay Corneal, Grand Valley State University

Panel: Embedding Technical Writing with Experiential Learning Components into Engineering Curricula
Dr. Lindsay Corneal, Grand Valley State University
Ms. Debbie Morrow, Grand Valley State University
Dr. Tracy Volz, Rice University
Dr. Ann Saterbak, Duke University
Dr. Susan Conrad, Portland State University
Mr. Timothy James Pfeiffer P.E., Foundation Engineering, Inc.
Kenneth Lamb, California State Polytechnic University, Pomona
Dr. William A. Kitch, Angelo State University

Innovations
1:30 p.m. - 3:00 p.m., Room 260 B, Convention Center - Salt Palace
Sponsor: Manufacturing Division
Moderators: Richard Chiou, Drexel University; Tzu-Liang Tseng, University of Texas, El Paso

Manufacturing Curriculum and Course Innovations
A Curriculum Innovation Framework to Integrate Manufacturing-related Materials and Quality Control Standards into Different Level Engineering Education
Dr. Hua Li, Texas A&M University, Kingsville
Prof. Kai Jin, Texas A&M University, Kingsville
Dr. Yue Zhang, Texas A&M University-Kingsville

A Deep Learning Graphical User Interface Application on MATLAB
Dr. Aditya Akundi, University of Texas, El Paso
Prof. Tzu-Liang Bill Tseng, University of Texas, El Paso
Zejing Cao, University of Texas at El Paso
Mr. Hoejin Kim, University of Texas, El Paso

Implementing Entrepreneurial-minded Learning (EML) in a Manufacturing Processes Course
Dr. Vishal R Mehta, Ohio Northern University
Dr. David R Mikesell P.E., Ohio Northern University

Integrating Soft Skill Development into a Manufacturing Systems Course
Dr. Faisal Aqlan, Penn State Behrend
Dr. Qi Dunsworth, Penn State Behrend
Dr. Mary L. Kahl, The Pennsylvania State University, the Behrend College

Teaching Manufacturing Technology through ‘Learning by Doing’ Approach
Dr. Zareena Gani, ADMC, Higher Colleges of Technology, UAE
Dr. Sangarappilai Sivaloganathan, United Arab Emirates University
Mr. Sajeev Karai, Higher Colleges of Technology
Mr. Huned Bohari Bohari, Higher Colleges of Technology

Non-Destructive Testing (NDT) and Evaluation Using Ultrasonic Testing Equipment to Enhance Workforce Skillset for Modern Manufacturing
Dr. Aditya Akundi, University of Texas, El Paso
Prof. Tzu-Liang Bill Tseng, University of Texas, El Paso
Mr. Md Fashiar Rahman
Dr. Eric D Smith, University of Texas, El Paso

M435 - Manufacturing Curriculum and Course
1:30 p.m. - 3:00 p.m., Room 252, Convention Center - Salt Palace
Sponsor: Manufacturing Division
Moderators: Richard Chiou, Drexel University; Yalcin Ertekin, Drexel University

Capstone Experience in Manufacturing Education
A Senior Design Project in Fabrication of Microfluidic HIV/Zika Viral Load and Monitoring Test Chips through Manufacturing Processes
Dr. Richard Chiou, Drexel University
Dr. Michael G Mauk P.E., Drexel University

M435B - Capstone Projects in Manufacturing
1:30 p.m. - 3:00 p.m., Room 252, Convention Center - Salt Palace
Sponsor: Manufacturing Division
Moderators: Richard Chiou, Drexel University; Yalcin Ertekin, Drexel University

Capstone Experience in Manufacturing Education
A Senior Design Project in Fabrication of Microfluidic HIV/Zika Viral Load and Monitoring Test Chips through Manufacturing Processes
Dr. Richard Chiou, Drexel University
Dr. Michael G Mauk P.E., Drexel University
Conference Sessions

Monday, June 25

Mr. Carlos Michael Ruiz, Drexel University
Student Project: Instrumentation and Control of Solar-Powered Algae Bioreactor
  Dr. Richard Chiou, Drexel University
  Dr. Michael G Mauk P.E., Drexel University
  Prof. Tzu-Liang Bill Tseng, University of Texas, El Paso
  Mr. carlos michael ruiz, Drexel University
  Mr. Jean Carlo Espaillat
  Mr. Senyu Wang

Interdisciplinary Senior Design Project to Develop a Teaching Tool: Filament Extruder
  Dr. Yalcin Ertekin, Drexel University
  Dr. Richard Chiou, Drexel University
  Dr. Irina Nicoleta Ciobanescu Husanu, Drexel University
  Mr. Joshua Seymour Leibowitz
  Jon Armstrong
  Nathan Laage, Drexel University

From Capstone Student-led Project to Experiential Learning Module: Design and Manufacturing of an Integrated System of Pico-Hydroelectric Generator and Water Filtration
  Dr. Irina Nicoleta Ciobanescu Husanu, Drexel University
  Dr. Michael G Mauk P.E., Drexel University
  Mr. Perry B. Gold
  Mr. Nando Tyler Orfanelli

Team Cleaning Robots
  Mr. Daniel R Khodos
  David I Adegbesan, Vaughn College of Aeronautics and Technology
  Oliver Khairallah
  Dr. Shouling He, Vaughn College of Aeronautics and Technology

M437 - Mathematics Division Technical Session 2
1:30 p.m. - 3:00 p.m., Room 155 C, Convention Center - Salt Palace
Sponsor: Mathematics Division
Moderator: William Fitzgibbon, University of Houston, College of Technology

The Crux: Promoting Success in Calculus II
  Dr. Doug Bullock, Boise State University
  Dr. Janet Callahan, Boise State University
  Ms. Jocelyn B. S. Cullers, Boise State University

Redesigned Application-oriented Integral Calculus Curriculum
  Dr. Leszek Gawarecki, Kettering University
  Prof. Yaomin Dong, Kettering University
  Prof. Gina Rablau, Kettering University

Creating Laboratories to Aid Student Modeling Ability in Calculus I
  Dr. Ashley Bernal, Rose-Hulman Institute of Technology
  Dr. Scott Kirkpatrick, Rose-Hulman Institute of Technology
  Dr. Jeffery J. Leader, Rose-Hulman Institute of Technology
  Miss Jessa B. Ward, Rose-Hulman Institute of Technology

Redesigning the Calculus Curriculum for Engineering Students
  Stacie Pisano, University of Virginia
  Dr. Hui Ma, University of Virginia

Prof. Bernard Fulgham, University of Virginia
Dr. Gianluca Guadagni, University of Virginia
Dr. Diana D Morris, University of Virginia
Mrs. Monika Abramenko, University of Virginia

Guided-Lecture Team Based Learning at Work: Teaching Differential Calculus to Part-time Engineering Students in Latin America.
  Ing. Jose Roberto Portillo, Universidad Galileo
  Dr. Alberth E Alvarado, Universidad Galileo
  Dr. Jorge Samayoa Ranero, Universidad Galileo

Have You Seen an Integral? Visual, Intuitive and Relevant Explanations of Basic Engineering-related Mathematical Concepts
  Dr. Daniel Raviv, Florida Atlantic University

M438 - Mechanical Engineering Division Technical Session 2
1:30 p.m. - 3:00 p.m., Room 355 B, Convention Center - Salt Palace
Sponsor: Mechanical Engineering Division
Moderator: Rungun Nathan, Pennsylvania State University, Berks Campus

An Arduino-Based Hardware Platform for a Mechanical Engineering Sophomore Design Course
  Dr. Mark David Bedillion, Carnegie Mellon University
  Dr. Karim Heinz Muci-Kuchler, South Dakota School of Mines and Technology
  Mr. Walelign Messele Nikshi, South Dakota School of Mines and Technology

Teaching Geometric Dimensioning and Tolerancing Concepts Using 3-D Computer Models and 3-D Printed Parts
  Dr. Oziel Rios, University of Texas, Dallas

A Bio-Inspired Mind Map to Assist in Concept Generation for Wall Climbing Systems: Development, Assessment, and Resulting Prototypes
  Dr. Daniel D. Jensen, U.S. Air Force Academy
  Dr. Kristin L. Wood, Singapore University of Technology and Design (SUTD)
  Aaron P Bauer, United States Air Force Academy
  Mr. Blake Perez, Singapore University of Technology and Design
  Milton Doria, United States Air Force Academy
  Dr. Michael Lawrence Anderson P.E., United States Air Force
  Luke Jensen, CREO

Two Approaches to Optimize Formula SAE Chassis Design Using Finite Element Analysis
  Dr. Tanveer Singh Chawla, Western Washington University
  Mr. Eric Leonhardt, Western Washington University

New Course Development and Assessment Tools in Automotive Lightweighting Technologies
  Prof. Raghu Echempati P.E., Kettering University

M439A - Student Advancement in Mechanics of Materials

Schedule subject to change: Please go to www.asee.org/icp for up to date information
M440 - Minorities in Engineering Division
Technical Session 2
1:30 p.m. - 3:00 p.m., Room 155 E, Convention Center - Salt Palace

Sponsor: Minorities in Engineering Division
Moderators: Lisa Abrams, Ohio State University; Orlando Hoilette, Purdue University-Main Campus, West Lafayette (College of Engineering)

Identity and Experiences

Mending the Gap: An Intentional Focus on Integrating Underrepresented Minority and Deaf/Hard-of-Hearing Students into the Research Culture (Experience)

Dr. Reginald E. Rogers Jr., Rochester Institute of Technology (COE)
Dr. Todd Pagano, Rochester Institute of Technology/ National Technical Institute for the Deaf

A Mixed-methods Study of Non-text Social Media Content as a Window into African-American Youth STEM Identities

Donna Auguste, University of Colorado, Boulder
Mrs. Tanya D. Ennis, University of Colorado, Boulder

M441 - Multidisciplinary Design I
1:30 p.m. - 3:00 p.m., Room 155 A, Convention Center - Salt Palace

Sponsor: Multidisciplinary Engineering Division
Moderators: Mary Pilotte, Purdue University-Main Campus, West Lafayette (College of Engineering); Sanjay Tewari, Louisiana Tech University

Designing a Comprehensive Project for a Junior-level Multidisciplinary Engineering Design Course

Mrs. Amanda C. Rutherford, Montana State University
Mr. Brad Thomas Stanton, Montana State University
Mrs. Staci Turoski
Mrs. Elizabeth B Varnes, Montana State University

Promoting Innovation in a Junior-level, Multidisciplinary, Electro-Mechanical Design Course

Dr. Wesley L. Stone, Western Carolina University
Dr. Robert Scott Pierce P.E., Western Carolina University
Prof. Sudhir Kaul, Western Carolina University

Teaching Mechanical Design for Mechatronics Engineering Students Using a Project-based Sequential Learning Approach

Dr. Bahaa kazem Ansaf, Colorado State University, Pueblo
Dr. Nebojsa I Jaksic P.E., Colorado State University, Pueblo

Designing for Children with Sensory Processing Disorders

Dr. Louise R Manfredi, Syracuse University
Prof. Bekir Kelceoglu, Syracuse University

M444 - Ocean and Marine Division Technical Session 3
1:30 p.m. - 3:00 p.m., Room 151 D, Convention Center - Salt Palace

Prof. Shelly Lynn Miller, University of Colorado Boulder
Dr. Joseph L. Polman, University of Colorado Boulder

Literature Review on Disability Participation in the Engineering Field

Elizabeth Marie Spingola, Virginia Tech Department of Engineering Education

Intersecting Identities of Women in Engineering

Dr. Ruby Mendenhall, University of Illinois at Urbana-Champaign
Dr. Kelly J. Cross, University of Illinois, Urbana-Champaign
Dr. Jennifer R. Amos, University of Illinois, Urbana-Champaign
Dr. Kathryn B.H. Clancy, University of Illinois, Urbana-Champaign
Prof. Princess Imoukhuede, University of Illinois at Urbana-Champaign
Jennifer G. Cromley, University of Illinois at Urbana-Champaign

Talking Engineering: Students’ Translanguaging in Engineering Education

Mrs. Greses Perez, Stanford University
Conference Sessions

Monday, June 25

Sponsor: Ocean and Marine Division
Moderators: Jennifer Michaeli, Old Dominion University; Robert Whalin, Jackson State University

Industrial Expectations for Marine Engineering Major Students
Dr. Wei Yu, Massachusetts Maritime Academy
Gail M. Stephens, Massachusetts Maritime Academy
Cmdr. William Haynes, Massachusetts Maritime Academy

Water Tunnel Design: A Senior Capstone Project to Promote Hands-on Learning in Fluids
Dr. Nathan John Washuta, The Citadel
Dr. Jason Howison, The Citadel
Mr. Billy L. Clark, The Citadel
Mr. Robert Hudson Imhoff IV
Luiz Dos Reis

M446 - Software Engineering Division Technical Session 2
1:30 p.m. - 3:00 p.m., Room 151 F, Convention Center - Salt Palace
Sponsor: Software Engineering Division
Moderator: James Valino

Teaching Software Testing with Automated Feedback
James Perretta
Dr. Andrew DeOrio, University of Michigan

Work in Progress: One Approach to Software Engineering Project Selection for Small Student Populations
Dr. Paul A Bender, Ohio Dominican University

Measuring Broader Impact of NSF-funded Project on Software Engineering Education
Dr. Sushil Acharya, Robert Morris University
Dr. Priya Manohar P.E., Robert Morris University
Prof. Peter Y Wu, Robert Morris University

Gamification in Computer Science Education: a Systematic Literature Review
Mrs. Mourya Reddy Narasareddy Gari, North Dakota State University
Dr. Gursimran Singh Walia
Mr. Alex David Radermacher, North Dakota State University

M447 - Student Division Business Meeting
1:30 p.m. - 3:00 p.m., Room 250 A, Convention Center - Salt Palace
Sponsor: Student Division

The ASEE Student Division executive committee will report out on their work in the past year and elections will be held for the new executive committee. Members will have an opportunity to share ideas, raise concerns, and get involved with the Student Division.

M449 - Technological and Engineering Literacy/Philosophy of Engineering Division Technical Session 1
1:30 p.m. - 3:00 p.m., Room 155 D, Convention Center - Salt Palace
Sponsor: Technological and Engineering Literacy/Philosophy of Engineering Division

What’s in a Name? Technology and the Image of Engineering
Dr. John Heywood, Trinity College Dublin

On Epistemic Diversity of Engineering and Engineering Education
Mr. Soheil Fatheiboroujeni, University of California, Merced

Developing Self-awareness in Learning Practices: Designing and Implementing a Survival Tool for Freshmen in Engineering
Neelam Prabhu Gaunkar, Iowa State University
Dr. Mani Mina, Iowa State University

Improvements in Undergraduate Electromagnetism Courses by Designing Experiences of Inquiry and Reflection
Miss Neelam Prabhu Gaunkar Prabhu Gaunkar, Iowa State University
Dr. Mani Mina, Iowa State University

Evaluation of Research Experience or Teachers (RET) Program Effectiveness as STEM Professional Development
Mrs. Katie Estridge Schneider, Colorado School of Mines
Amy Charlotte Martin P.E., Colorado School of Mines
Dr. Terri S. Hogue, Colorado School of Mines

M450 - Engineering/Engineering Technology Transfer Issues: Two-year College to Four-year College
1:30 p.m. - 3:00 p.m., Room 254 B, Convention Center - Salt Palace
Sponsor: Two-Year College Division
Moderator: Carl Whitesel, South Mountain Community College

Issues facing engineering/engineering technology students from two-year colleges who transfer to four-year engineering/engineering technology programs.

Avenue-E: An Innovative Student Transfer Pathway Program
Dr. Jennifer Sinclair Curtis, University of California, Davis
Beth Frances Broome
Mrs. Cynthia Murphy-Ortega, Chevron Corporation

Insights on Retention of Underrepresented Minority Electrical and Computer Engineering Transfer Students (Experience)
Dr. Samuel Paul Merriweather, Texas A&M University
Dr. Karen L. Butler-Purry, Texas A&M University
Dr. Shannon Walton, Texas A&M University
Judy Kelley

Scholarship Programs for Vertical Transfers in Engineering and Engineering Technology
Dr. Surendra “Vinnie” K. Gupta, Rochester Institute of Technology (COE)
Dr. James E. Moon, Rochester Institute of Technology (COE)
Dr. Roy W. Melton, Rochester Institute of Technology (COE)
Dr. Michael E. Kuhl, Rochester Institute of Technology (CAST)
Prof. Daniel P. Johnson, Rochester Institute of Technology (CAST)
Mr. Todd Dunn, Rochester Institute of Technology (CAST)
M451 - Best Practices for Faculty Advisors of Student Chapters/Sections of Professional/Honorary Engineering Societies
1:30 p.m. - 3:00 p.m., Room 150 D, Convention Center - Salt Palace
Sponsors: Women in Engineering Division; New Engineering Educators Division; Student Division
Moderator: Inci Ruzybayev, York College of Pennsylvania
Speakers: Dr. Becky Bittle, Texas Christian University; Dr. Diane L. Peters P.E., Kettering University; Dr. Beth Todd, University of Alabama; Dr. Marca J Lam, Rochester Institute of Technology (COE); Dr. Karinna M Vernaza, Gannon University; Dr. Ted Song, John Brown University; Prof. Elizabeth Hill, University of Minnesota Duluth
Faculty members—oftentimes new engineering faculty members—may be asked or assigned to be faculty advisers to the student chapter/section at their university of a professional or honorary engineering society. Often the new adviser is given little guidance to help them in this role. The purpose of this panel is to offer an opportunity for engineering faculty, current/new faculty advisers, graduate students and undergraduate students to hear experienced faculty advisers from different universities discuss best practices, important problems, perspectives, and solutions for faculty advisers working with student engineering societies. The panelists act as faculty advisers for such organizations as Society of Women Engineers, Tau Beta Pi, ASME, IEEE, SME, SAE AutoDrive, Baja, and others. They are familiar with the organizations, students, culture, and professional constraints of the audience. It differs from paper sessions in that the panelists are not limited to discussing new research, but can talk about a variety of issues and best practices known in the advising community. It also offers a chance for members of the audience to ask open-ended questions of these advisors regarding problems they have encountered.

M451B - Women in Engineering Division

Schedule subject to change: Please go to www.asee.org/icp for up to date information
Monday, June 25

Conference Sessions

M455 - Literature and Research Perspectives on Engineering Leadership Development
1:30 p.m. - 3:00 p.m., Salon I, HQ Hotel - Marriott at City Creek
Sponsor: Engineering Leadership Development Division
Moderator: Alison Olechowski, University of Toronto

Examining the Engineering Leadership Literature: Community of Practice Style
Dr. Cindy Rottmann, University of Toronto
Dr. Doug Reeve, University of Toronto
Mr. Mike Klass, University of Toronto
Dr. Serhiy Kovalchuk, University of Toronto
Dr. Qin Liu, University of Toronto
Dr. Alison Olechowski, University of Toronto
Ms. Madeleine Santia,
Understanding the Perceived Impact of Engineers’ Leadership Experiences in College
Dr. William J. Schell IV P.E., Montana State University
Dr. Bryce E. Hughes, Montana State University
Mr. Brett Tallman, Montana State University
Engineering Students and Group Membership: Patterns of Variation in Leadership Confidence and Risk Orientation
James N Magarian, Massachusetts Institute of Technology
Dr. Alison Olechowski, University of Toronto
The Engineering Leader of the Future: Research and Perspectives
Dr. Meg Handley, Pennsylvania State University, University Park
Dr. Jeffery M. Plumblee II, The Citadel
Mr. Andrew Michael Erdman, The Pennsylvania State University
Faculty, Student, and Practitioner Initial Conceptions of Leadership
Dr. Kenneth Lamb P.E., California State Polytechnic University, Pomona
Mr. Werner Zorman, Harvey Mudd College
Dr. Alicia M. Kinoshita, San Diego State University
Dr. Natalie Mladenov, San Diego State University

M456 - Military and Veterans Division Technical Session 1: Academic Transition
1:30 p.m. - 3:00 p.m., Room 255 C, Convention Center - Salt Palace
Sponsor: Military and Veterans Division
Moderator: David Stringer, Kent State University, Kent

This session contains papers discussing topics related to veterans transitioning into the academic environment.

Supporting Service Member Transition into Academia: MOOCs on Engineering Fundamentals
Prof. Aldo A. Ferri, Georgia Institute of Technology

M480 - STEM Faculty Development Research Project
1:30 p.m. - 3:00 p.m., Room 151 E, Convention Center - Salt Palace
Sponsor: Faculty Development Constituency Committee
Speakers: Dr. Karen A. High, Clemson University; Dr. Cindy M. Lee, Clemson University

Session Description
This session is a hands-on gathering to develop research projects that will build on a National Science Foundation-funded research agenda on holistic STEM faculty development (NSF grant #EEC-1638888, for more details see www.clemson.edu/ese/stemfacdev). The intended audience includes researchers interested in understanding holistic STEM faculty development (FD) that examines holistic development on research, teaching, leadership, and service. The format of the session will be an introduction to the research agenda and activities geared towards participants leaving with a concrete plan for development of a research project of their own. The goals of the session are 1) to examine the research agenda and all of its components and 2) to develop the foundation for research projects that the participants wish to pursue. A breakdown of the activities and the required time for each activity for the proposed session is shown below:

Activities and Time for the Proposed Sessions
Activity - Time - Participant Engagement
Overview - 5 minutes - Participants will consider the potential benefits they may gain from developing a STEM FD research project.
Specifics of Research Agenda - 20 minutes - Participants will be challenged to understand the various parts of the research agenda.
Q & A - 5 minutes - Participants will be given the opportunity to ask for specific information about the agenda components.
Guided Research Program Development - 40 minutes - Participants will be challenged to think through the many considerations underlying a complete research project as well as network with other session attendees to form potential collaborations.
Report Out and Wrap-Up - 20 minutes - Participants will share with the other attendees the research they framed as well as pose and answer specific questions regarding their plan.

The Guided Research Program Development will provide the participants with a handout that will lead them through the various steps necessary to develop a research plan, such as articulating the goals and objectives; determining appropriate research questions, potential collaborators, and assessment and evaluation strategies for the research program. The participants will work in pairs or small groups that have similar interests where they will briefly introduce their research ideas

Dr. Wayne E. Whiteman, Georgia Institute of Technology
Supporting Veteran Students Transitioning to Engineering
Dr. Colleen Janeiro, East Carolina University
Dr. Teresa Ryan, East Carolina University
Mr. Jeff Foeller, East Carolina University
Ms. Melissa Ann Hall
The Evolution of College Credit Recommendations for the United States Army by the American Council on Education
Janet C. Ford, Western Carolina University
Dr. George D. Ford, Western Carolina University

Documents
Dr. Nathan E. Canney
Dr. Yanna Lambrinidou, Virginia Tech

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to each other and provide feedback to each other for their projects. Lastly, the participants will be given another opportunity to report out on their progress and ask additional questions of the group followed by a brief wrap-up of the key points. We will provide the handouts for the Guided Research Program Development.

Background on Research Agenda
Understanding the many roles of faculty engaged in teaching and learning of science, technology, engineering, and mathematics (STEM) can enhance effective teaching and learning. Research in holistic STEM faculty development has not been a major focus; therefore, a workshop dedicated to drafting a national research agenda supported by the National Science Foundation was held. The participants followed three threads of inputs, processes, and outputs. They generated research questions during the first day and organized ideas generated into concept maps during the second day. Authors have since analyzed this participant-generated data to form a research agenda. Important ideas that emerged from the inputs thread included exploring motivation, identity, and culture to advance STEM faculty development. The ideas from participants in the processes thread also identified culture as important for research along with development processes, assessment of models, and who are the learners. Themes that emerged from the outputs thread included metrics for assessment, identity of faculty developers, and importance of graduate students as an audience and product of faculty development.

Why a Non-traditional Format is Needed
The main goal of this session is to engage participants in developing research projects that are focused on holistic STEM faculty development based on the NSF-funded research agenda. As such, the participants will need to be able to interact with the agenda and potential collaborators. The participants will be developing draft research plans using guided session worksheets. These activities cannot be accomplished in a traditional presentation setting.

M502 - Architectural Division Technical Session 2
3:15 p.m. - 4:45 p.m., Room 151 C, Convention Center - Salt Palace
Sponsor: Architectural Engineering Division
Moderator: Mary Ann Frank, Indiana University Purdue University, Indianapolis

Developing and Testing an Inter-disciplinary Course of Sustainable Technology Innovation for Urban Design
- Prof. Xiaojing Yuan, University of Houston, College of Technology
- Dr. Bruce Alan Race FAIA, FAICP, University of Houston

Learning Building Sciences in Virtual Environments
- Dr. Debra Lee Davis, Florida International University
- Prof. Shahin Vassigh, Florida International University
- Hadi Alhaffar
- Albert John Elias IV, Aberrate LLC
- Ms. Giovanna Gallardo, Florida International University

Evaluating Visual Comfort Metrics of Responsive Facade Systems as Educational Activities
- Ms. Negar Heidari Matin, Eastern Michigan University
- Dr. Ali Eydgahi, Eastern Michigan University
Monday, June 25

Conference Sessions

Dr. Richard A. House, Rose-Hulman Institute of Technology
Dr. Scott Kirkpatrick, Rose-Hulman Institute of Technology
Dr. Ashley Bernal, Rose-Hulman Institute of Technology
Modeling and Design: a Hands-on Introduction to Biomedical Engineering
Dr. Eileen Haase PhD, Johns Hopkins University
An In-depth Analysis of Open-ended Biomedical Engineering Design Problems and the Role of Metacognition in Their Solutions
Miss Hannah Yssels
Dr. Marina Crowder
Ozcan Gulacar, University of California, Davis
Dr. Jennifer H. Choi, University of California, Davis
Patient Centered Design in Undergraduate Biomedical Engineering
Dr. Timothy E. Allen, University of Virginia
Mr. David Chen, University of Virginia

M505 - Hands-On Projects and Demos
3:15 p.m. - 4:45 p.m., Salon I, HQ Hotel - Marriott at City Creek
Sponsor: Chemical Engineering Division
Moderator: Daniel Burkey, University of Connecticut
Presentations focusing on hands-on projects and demonstrations.
3-D Printing and Arduino in the Chemical Engineering Classroom:
  Protein Structures, Heat Exchangers, and Flow Cells
    Dr. Jacob James Elmer, Villanova University
    Dr. Daniel Adam Kraut, Villanova University
Citizen Scientists Engagement in Air Quality Measurements
    Prof. Anthony Butterfield, University of Utah
    Katrina My Quyen Le, AMES High School
Transference of Hands-on Desktop Learning Pedagogy Across Institution and Program Types
    Ms. Negar Beheshiti Pour, Washington State University
    Kitana Manivone Kaiphanliam, Washington State University
    Dr. Arsham Nazempour, Washington State University
    David B. Thiessen, Washington State University
    Prof. Robert F. Richards, Washington State University
    Mr. Fanhe Shamus Meng, Washington State University
    Dr. Olusola Adeospe, Washington State University
    Dr. Sarah A. Wilson, University of Kentucky
    Dr. Derek L. Englert, University of Kentucky
    Prof. Bernard J. Van Wie, Washington State University
The River Project: an Open-Ended Engineering Design Challenge from Bench-Scale to Pilot-Scale
    Dr. Lucas James Landherr, Northeastern University
    Dr. Courtney Pfluger, Northeastern University
    Prof. Ryan A Koppes, Northeastern University

M506 - Sustainability in Civil Engineering
3:15 p.m. - 4:45 p.m., Room 151 A, Convention Center - Salt Palace
Sponsor: Civil Engineering Division
Moderators: Claire Danz, Clemson University; Steven Burian, University of Utah
Development and Assessment of Three Envision Case Study Modules Connecting Behavioral Decision Science to Sustainable Infrastructure
    Mr. Nathan McWhirter, Virginia Tech
    Dr. Tripp Shealy, Virginia Tech
Exploring Gender Differences in Students’ Sustainability Beliefs in Upper-level Engineering Courses
    Ms. Marisa Swift, Purdue University, West Lafayette
    Dr. Allison Godwin, Purdue University-Main Campus, West Lafayette
    Dr. Tripp Shealy, Virginia Tech
Measuring Misconceptions About Climate Change Between Freshmen and Senior Civil Engineering Students
    Dr. Tripp Shealy, Virginia Tech
Senior Civil Engineering Students’ Views on Sustainability and Resiliency
    Dr. Noah Salzman, Boise State University
    Prof. Bhaskar C. S. Chittoori, Boise State University
    Dr. Sondra M. Miller, Boise State University
    Mr. Thomas A. Robbins
Methods for Measuring Systems Thinking: Differences Between Student Self-assessment, Concept Map Scores, and Cortical Activation During Tasks About Sustainability
    Mo Hu, Virginia Tech
    Dr. Tripp Shealy, Virginia Tech

M507 - College Industry Partnerships Division
Technical Session 1
3:15 p.m. - 4:45 p.m., Room 253 B, Convention Center - Salt Palace
Sponsor: College Industry Partnerships Division
An Effective Industry-University Partnership to Develop Tomorrow’s Workforce
    Dr. Reg Recayi Pecen, Sam Houston State University
    Dr. Faruk Yildiz, Sam Houston State University
    Dr. Iftekhar I. Basith, Sam Houston State University
    Matt Albrecht, Quanta Services
AAS Controls Technology Stackable Degree Education Requirements for Employees by Highly Automated Manufacturing Companies Drives a Collaborative Pathway at Weber State University
    Ms. Julanne K. McCulley, Weber State University
    Alumni Grassroots Leadership Enables Sponsored Course Development
    Dr. Vladimir I. Prodano, California Polytechnic State University, San Luis Obispo
    John Greene, Maxim Integrated
The Industry Scholars Program: An Immersive Professional Experience for Undergraduates
    Dr. Breanne Przestrzelski, University of San Diego
    Dr. Chell A. Roberts, University of San Diego
    Dr. Leonard A. Perry, University of San Diego
“Lean and Green” Assistance for Businesses in the U.S.-Mexico Border Region: A Retrospective

Schedule subject to change: Please go to www.asee.org/icp for up to date information
Conference Sessions

Monday, June 25

Design of a Virtual Laboratory for Automation Control
Mr. Zelin Zhu
Prof. Yuzhong Shen, Old Dominion University
Dr. Cheng Y. Lin P.E., Old Dominion University
Mr. Shuo Ren, Old Dominion University
Ms. Katherine Smith, Old Dominion University
Dr. Anthony W. Dean, Old Dominion University

Innovative Approach to Online Argumentation in Computing and Engineering Courses
Dr. Swaroop Joshi, Ohio State University
Dr. Neelam Soundarajan, Ohio State University
Dr. Jeremy Morris, Ohio State University

Characterizing MOOC Learners from Survey Data Using Modeling and n-TARP Clustering
Mr. Taylor V. Williams, Purdue University, West Lafayette
Dr. Kerrie A. Douglas, Purdue University, West Lafayette
Mr. Tarun Yellamraju, Purdue University, West Lafayette
Prof. Mireille Boutin, Purdue University, West Lafayette

M508 - COED: Autograding and Autoadvising
3:15 p.m. - 4:45 p.m., Room 255 E, Convention Center - Salt Palace
Sponsor: Computers in Education Division
Moderators: Mike Pitcher, University of Texas, El Paso; Cameron Macdonell
This session will focus on the presentation of papers that deal with computer-based tools that aid in the grading or advising of undergraduate students.

Meet AD-VISOR: An Adaptive Advising System for a 21st Century Student Demographic
Mr. Mike Thomas Pitcher, University of Texas, El Paso
Dr. Peter Golding, University of Texas, El Paso
Mr. Pedro Arturo Espinoza, University of Texas, El Paso
Miss Crystal Fernandez-Pena, University of Texas, El Paso
Celena Arreola, The University of Texas, El Paso
Mr. Hugo Gomez, University of Texas, El Paso
Hector Erick Lugo Nevarez, University of Texas, El Paso
Mr. Randy Hazael Anaya, University of Texas, El Paso
Prof. Diane Elisa Golding, University of Texas, El Paso
Miss Kelsi Marie Oyler, Engineering Leadership
Ms. America Fernandez, University of Texas, El Paso
Mrs. Helen Elizabeth Geller, University of Texas, El Paso
Ms. Jennifer Arreola, University of Texas, El Paso
Ms. Andrea Annette Duequez, Karla Alejandra Ayala

Developing and Testing an Electronic Homework System to Improve Student Engagement and Learning in Engineering Thermodynamics
Dr. Stephen W. Crown, University of Texas, Rio Grande Valley
Prof. Constantine Tarawneh, University of Texas, Rio Grande Valley
Jazmín Ley, University of Texas, Rio Grande Valley

Detecting Plagiarism in SolidWorks CAD Courses
Dr. Webster R. Johnson, California State University, Chico

M508 - COED: Online and Blended Learning Part 1
3:15 p.m. - 4:45 p.m., Room 355 B, Convention Center - Salt Palace
Sponsor: Computers in Education Division
Moderator: Curtis Cohenour, Ohio University
This session will be one of two sessions dealing with papers related to online and blended learning.

Digital Learning Preferences: What Do Students Want?
Dr. Carole E. Goodson, University of Houston
Prof. Susan L. Miertschin, University of Houston
Dr. Barbara Louise Stewart, University of Houston

M508B - COED: Online and Blended Learning
3:15 p.m. - 4:45 p.m., Room 355 B, Convention Center - Salt Palace
Sponsor: Computers in Education Division
Moderator: Curtis Cohenour, Ohio University
This session will be one of two sessions dealing with papers related to online and blended learning.

Digital Learning Preferences: What Do Students Want?
Dr. Carole E. Goodson, University of Houston
Prof. Susan L. Miertschin, University of Houston
Dr. Barbara Louise Stewart, University of Houston

M509 - Construction Division Technical Session
3: Case Studies
3:15 p.m. - 4:45 p.m., Room 257 B, Convention Center - Salt Palace
Sponsor: Construction Engineering Division

Integrating Micro-House Design and Construction into the Construction Management and Engineering Curriculum
Prof. Edwin W. Schmickpepper, Norwich University
Dr. John Edward Patterson, Norwich University
Dr. Nadia Al-Aubaidy, Norwich University

A Multimedia User-experience System with 3-D Simulation for the Construction Process of Nanwang Water Diversion Pivotal Project on China’s Grand Canal
Miss Jing Wen, Ohio State University
Mr. Jin Rong Yang, Ohio State University
Dr. Michael Parke, Ohio State University
Mr. Adrian Hadipriono Tan, Ohio State University
Prof. Fabian Hadipriono Tan Dr.Eng., Ohio State University

Serving through Building: Sustainable Houses for the Gnome
People in Cieneguita, Panama
Prof. Lauren W. Redden, Auburn University
Mrs. April E. Simons P.E., Auburn University
Prof. Scott William Kramer, Auburn University
Mr. Trenton Huffines

Exploratory Study of Facility Management Education
Opportunities at the University of Oklahoma
Dr. Anthony Perrenoud, University of Oklahoma
Mr. Juvenal Huizar, University of Oklahoma

M510 - Welcome to the Academy!: Exploring Career Transitions from Industry to Academia
3:15 p.m. - 4:45 p.m., Room 151 E, Convention Center - Salt Palace
Sponsor: Continuing Professional Development Division
Moderator: Mark Schuver, Purdue University-Main Campus, West
Lafayette (College of Engineering)
Speakers: Dr. Mitchell L. Springer PMP, SPHR, SHRM-SCP, Purdue University-Main Campus, West Lafayette (College of Engineering); Dr. Taryn Melkus Bayles, University of Pittsburgh; Miss Krysta Weed, Auburn University; Dr. Keith Plemons P.E., The Citadel

As working adults in business and industry transition through the many vertical and horizontal career phases of professional employment, they frequently envision alternative careers in higher education. While the academy is rich in employment opportunities, individuals wishing to make the career move into higher education seek to understand the many alternatives available. From a macro perspective, positions within higher education may be generally classified into two pure classifications with numerous permutations along the continuum. On one end of the continuum are tenure-related positions, namely assistant, associate and full professor tenure and tenure-track. On the opposite end of the continuum are staff positions, composed of administrative and management. While administrative/management positions are primarily focused on performing non-teaching activities, there are significant opportunities for this group to, in fact, teach. In between these two pure ends of the continuum are non-tenured and non-tenure track, adjunct-related positions such as limited and continuing term lecturers. Limited term lecturers are frequently referred to in a more common vernacular, “adjuncts.” These individuals are paid to teach on a course-by-course basis, without additional benefits. Continuing term lecturers are employed full time with the university and receive attendent benefits; but yet, are not on a tenure track. This panel session will focus on:
• The many opportunities within higher education available as alternate career paths for those individuals seeking to transition from business and industry into higher education.
• The existing state and trends for both tenure/tenure-track and non-tenure-track positions.
• The advantages and perceived disadvantages of bringing business/industry experience into the teaching profession.
• The challenges and opportunities individuals face in transitioning from business/industry into the academy.
• More generally, what might be expected should an individual wish to pursue a tenure or tenure-track opportunity.

M5101A - Zone I Business Meeting
3:15 p.m. - 4:45 p.m., Room 251 C, Convention Center - Salt Palace
Sponsor: Council of Sections

M5101B - Zone II Business Meeting
3:15 p.m. - 4:45 p.m., Room 251 D, Convention Center - Salt Palace
Sponsor: Council of Sections

M5101C - Zone III Business Meeting
3:15 p.m. - 4:45 p.m., Room 251 E, Convention Center - Salt Palace
Sponsor: Council of Sections

M5101D - Zone IV Business Meeting
3:15 p.m. - 4:45 p.m., Room 251 F, Convention Center - Salt Palace
Sponsor: Council of Sections

M5103 - ERC Board and Planning Committee Meeting
3:15 p.m. - 4:45 p.m., Room 250 A, Convention Center - Salt Palace
Sponsor: Engineering Research Council
This is a meeting for the ERC Board and Planning Committee. By Invitation only.

M5109A - Sponsor Technical Session: Oroville Dam Spillway Incident and Recovery - Presented by Utah State
3:15 p.m. - 4:45 p.m., Room 150 B - Sponsor Tech Room, Convention Center - Salt Palace
Sponsor: Sponsored Sessions
Utah State University’s Dr. Michael Johnson will lead a panel discussion about the incident and recovery of the Oroville Dam spillway. Dr. Johnson, research professor, Utah Water Research Laboratory, will be joined by the California Department of Water Resource’s Ted Craddock, assistant deputy director of the State Water Project; and Dale Brown, project manager, Oroville Emergency Recovery–Spillways. Also joining the panel is Dave Marble, state dam safety engineer for the state of Utah. Utah State University has played an important role in the spillway recovery. Dr. Johnson and a team of engineers and students at the Utah Water Research Lab designed and constructed a 1:50 scale model of the Oroville spillway to test repair and replacement solutions for the ongoing recovery effort.

M5109B - Sponsor Technical Session: Overcoming Obstacles to Project-based Learning—Presented by National Instruments
3:15 p.m. - 4:45 p.m., Room 150 A - Sponsor Tech Room, Convention Center - Salt Palace
Sponsor: Sponsored Sessions
In the next decade, engineers will be at the forefront of tackling the ever-growing societal challenges we face as a global community and the ambitious technological opportunities we’re embracing, such as autonomous electric vehicles, 5G, and renewable energy. Across each of these areas, we face urgency: innovation cannot wait. Preparing students for such challenges means ensuring that students rapidly transcend engineering theory and apply their skills to real, authentic design challenges in the classroom, in preparation for academic research and employment. Project-based learning and active learning continue to be drivers of curricula that meet the needs of educators, students, and industry; however, there are still challenges to implementing the correct approach into the classroom. Discover four case studies of universities and their approaches to advocating change in how they teach, how students

Wednesday, June 27

Thursday, June 28
learn, and ultimately how to drive results in engagement, retention, and student satisfaction.

Presenters
• Brian Hayt, Academic Product Marketing, National Instruments
• Stephanie Amrite, Americas Marketing Manager, Academic and Software, National Instruments
• Bhavesh Mistry, Head of Marketing, Academic, National Instruments

to understand what works and does not in how sexual harassment is handled, and to gather feedback about potential strategies and policies that might enable institutions to reduce sexual harassment. The resulting report from the committee details the results of this information gathering and makes recommendations for addressing and preventing sexual harassment in academic science, engineering, and medicine. Four members of the CWSEM will discuss the report, the findings, and recommendations for engineering education faculty and administrators.

### M5112A - Impacts of Sexual Harassment in Academic Science, Engineering, and Medicine
3:15 p.m. - 4:45 p.m., Room 255 F, Convention Center - Salt Palace

**Sponsors:** ASEE Diversity Committee; Environmental Engineering Division; Instrumentation Division; Mechanics Division; Engineering Physics and Physics Division; Engineering Libraries Division; New Engineering Educators Division; Engineering Technology Division; Biomedical Engineering Division; Civil Engineering Division; Undergraduate Experience Committee; Faculty Development Constituency Committee; Energy Conversion and Conservation Division; Continuing Professional Development Division; Multidisciplinary Engineering Division; Military and Veterans Division; Liberal Education/Engineering & Society Division; Student Division; Minorities in Engineering Division; Engineering Ethics Division; International Division; Community Engagement Division; Women in Engineering Division

**Moderator:** Frazier Benya, National Academy of Engineering

**Speakers:** Dr. Frazier Benya, National Academy of Engineering; Dr. Alice Merner Agogino, University of California, Berkeley; Dr. Nicholas Arnold; Dr. Gilda A. Barabino, City College of the City University of New York

Responding to growing awareness of sexual harassment in academia, the Committee on Women in Science, Engineering, and Medicine (CWSEM) of the National Academies of Sciences, Engineering, and Medicine initiated a study on the impacts of sexual harassment on the career advancement of women in these disciplines in academia. The study committee conducted (1) a review of research on the extent to which women are victimized by sexual harassment, (2) an examination of information on the extent to which sexual harassment in academia negatively impacts the recruitment, retention, and advancement of women pursuing careers in science, engineering, and medicine, and (3) an analysis of policies, strategies, and practices that have been most successful in preventing and addressing sexual harassment. They gathered information through public workshops on the prevalence of sexual harassment, impacts of harassment and reporting procedures, legal requirements of Title IX and Title VII, strategies for training, and approaches at the federal, professional society, and institutional level for preventing and addressing sexual harassment. Consultant Kevin Swartout, from Georgia State University, analyzed results from the Administrator Research Campus Climate Collaborative (ARC3) to reveal the incidence of sexual harassment on college campuses among students in the STEM fields. Additional consultants from RTI conducted 40 individual telephone interviews with female faculty in science, engineering, and medicine to understand the impact sexual harassment has on academic careers of women in these fields,

### M515A - Electrical and Computer Division Technical Session 3
3:15 p.m. - 4:45 p.m., Room 355 F, Convention Center - Salt Palace

**Sponsor:** Electrical and Computer Division

**Moderator:** Dennis Silage, Temple University

**Presenters**
- Prof. Kenneth A. Connor, Rensselaer Polytechnic Institute
- Prof. Dr. Paul M. Schoch, Rensselaer Polytechnic Institute
- Kathy Ann Gullie Ph.D., Gullie Consultant Services
- Dr. Dianna Newman, University at Albany-SUNY
- Dr. Shyula Sawyer Armand, Rensselaer Polytechnic Institute
- Dr. Jeffrey Braunstein, Rensselaer Polytechnic Institute

**Workshops:**
- **Throwing Away the Course-centric Teaching Model to Enable Change**
  - Dr. Anthony A. Maciejewski, Colorado State University
  - Prof. Tom Chen, Colorado State University
  - Prof. Zinta S. Byrne, Colorado State University
  - Ms. Melissa D. Reese, Colorado State University
  - Prof. Braniislav M. Notaros, Colorado State University
  - Dr. Ali Pezeshki, Colorado State University
  - Dr. Ali Pezeshki, Colorado State University
  - Ms. Andrea M. Leland, Colorado State University
  - Dr. Laura B. Sample McMeeking, Colorado State University
  - Dr. Thomas J. Siller, Colorado State University
  - Dr. Jeff T. Benya, National Academy of Engineering

**Courses:**
- **Flipping a Hardware Design Class: An Encouragement of Active Learning, Should it Continue?**
  - Dr. Nader Kapla, Boise State University
  - H. Shelton Jacinto, Boise State University

**Collaborative Interdisciplinary Research Through Projects From Concept To Completion**
- Prof. Shahnam Mirzaei, California State University, Northridge
- Prof. Ana Cristina Cadavid, California State University, Northridge
- Dr. Vicki A Pedone, California State University, Northridge
- Dr. Werner Horn, Harvey Rich

Schedule subject to change: Please go to [www.asee.org/icp](http://www.asee.org/icp) for up to date information
Conference Sessions

M516 - Annual Business Meeting
3:15 p.m. - 4:45 p.m., Room 250 F, Convention Center - Salt Palace
Sponsor: Energy Conversion and Conservation Division
Free ticketed event

M517 - Engineering and Public Policy Division Technical Session 2
3:15 p.m. - 4:45 p.m., Room 260 A, Convention Center - Salt Palace
Sponsor: Engineering and Public Policy Division
Moderators: Deanna Matthews, Carnegie Mellon University; Daniel Oerther, Missouri University of Science and Technology
Leveraging the NAM's 'Getting Nurses on Boards Coalition' to Promote NAE's 'Changing the Conversation' Campaign
Dr. Daniel B. Oerther, Missouri University of Science and Technology
MEERCat: A Case Study of How Faculty-led Research Initiatives Gave Rise to a Cross-departmental Research Center with Potential to Inform Local Policy
Mr. Rohit Kandakatla, Purdue University, West Lafayette
Dr. Angela Goldenstein, Purdue University, West Lafayette
Dr. David Allen Evenhouse, Purdue University, West Lafayette
Dr. Edward J. Berger, Purdue University, West Lafayette
Dr. Jeffrey F. Rhoads, Purdue University, West Lafayette
Dr. Angela Goldenstein, Purdue University, West Lafayette
Prof. Jennifer DeBoer, Purdue University, West Lafayette
Economic and Pedagogical Analysis of an Alternative Model of Engineering Education
Dr. R. Alan Cheville, Bucknell University
Dr. John Heywood, Trinity College Dublin
Dr. Charles James Larkin, Trinity College Dublin
Dr. Shaen Corbet, Dublin City University
An Exploration on the Reform of China's Engineering Education under the Background of 'Made in China 2025'
Dr. Huiming Fan, East China University of Science and Technology

M520 - Engineering Ethics Division Technical Session 2
3:15 p.m. - 4:45 p.m., Room 155 F, Convention Center - Salt Palace
Sponsor: Engineering Ethics Division
Moderators: Marilyn Dyrd, Oregon Institute of Technology; Rosalyn Berne, University of Virginia
Interim Results of a Longitudinal, Multi-site Survey of Perceptions of Academic Integrity
Mr. Samson Pepe Goodrich, East Carolina University
Dr. Teresa Ryan, East Carolina University
Dr. Colleen Janeiro, East Carolina University
Dr. Patrick F. O'Malley, Benedictine College
Where Should We Begin? Establishing a Baseline for First-year Student Awareness of Engineering Ethics
Ms. Natalie C.T. Van Tyne, Virginia Tech
Dr. Ingrid St. Omer, Virginia Tech

Monday, June 25

The Effectiveness of Webinars in Professional Skills and Engineering Ethics Education in Large Online Classes
Mr. Brendon Lumgair P.Eng., University of Calgary
A Midwestern Ghost Town: Times Beach, Missouri
Dr. Marilyn A. Dyrd, Oregon Institute of Technology
In-vitro Fertilization (IVF) as a Sociotechnical System: Using Actor-network Theory (ANT) for Teaching Undergraduate Engineers About the Ethics of Assisted Reproductive Technology (ART)
Prof. Rosalyn W. Berne, University of Virginia

M522 - EMD Business Meeting
3:15 p.m. - 4:45 p.m., Room 250 F, Convention Center - Salt Palace
Sponsor: Engineering Management Division

M523 - ETD Executive Board
3:15 p.m. - 4:45 p.m., Room 250 E, Convention Center - Salt Palace
Sponsor: Engineering Technology Division
Annual business meeting

M523B - A Technology Potpourri I
3:15 p.m. - 4:45 p.m., Room 253 A, Convention Center - Salt Palace
Sponsor: Engineering Technology Division
Moderators: Mark Pugano, University of Washington, Tacoma; Faruk Yildiz, Sam Houston State University
Implementing Graphene and Graphene Oxide in a Proton Exchange Membrane Fuel Cell
Dr. Hazem Tawfik, State University of New York, Farmingdale
Dr. Yeong Ryu, State University of New York, Farmingdale
Miss Srivasrsha Govindarajan, Farmingdale State College
Performance of a Linux-based Network Router
Dr. David Border, Bowling Green State University
Structured Programming Methodology and Its Role in Cognitive Development in Problem Solving Skills
Prof. Omer Farook, Purdue University Northwest
Dr. Jai P. Agrawal, Purdue University Northwest
Prof. Ashfaq Ahmed P.E., Purdue University Northwest
Dr. Wangling Yu, Purdue University Northwest
Mr. Hassan Abdullah Alibrahim, Purdue University Northwest
Dr. Athula Kulatunga, Purdue University Northwest
Dr. Ahmed S. Khan, Academic Platform, Lombard, IL
Dr. Qudsia Tahmina, Ohio State University
Mining Robot Control Using Wireless Communication and Embedded Systems
Teshad Chambers
Dr. Jimmyun Jo, Virginia State University
Dr. Christopher Washington, Virginia State University
Dr. Wei-Bang Chen, Virginia State University
Introduction of Mechatronics Specialization through Concentration Areas in the Mechanical and Electrical Engineering
Conference Sessions

Monday, June 25

Technology Programs
Dr. Otilia Popescu, Old Dominion University
Dr. Vukica M. Jovanovic, Old Dominion University
Dr. Sanjeevi Chitikeshi
Dr. Mileta Tomovic, Old Dominion University
Dr. Isaac L. Flory IV, Old Dominion University

M524 - Entrepreneurship and Engineering Innovation Division Technical Session 3
3:15 p.m. - 4:45 p.m., Room 255 D, Convention Center - Salt Palace
Sponsor: Entrepreneurship and Engineering Innovation Division
Moderators: Nicholas Fila, Iowa State University; Cynthia Fry, Baylor University

Student-created Canvases as a Way to Inform Decision-making in a Capstone Design Sequence
Prof. Joe Tranquillo, Bucknell University
Dr. William A. Kline, Rose-Hulman Institute of Technology
Dr. Cory Hixson, Rowan University
Evaluating Innovations from a Critical Thinking Approach
Dr. Sarah Jane Grigg, Clemson University
Assessment and Evaluation of Villanova University’s Engineering Entrepreneurship Minor Program
Dr. Pritpal Singh, Villanova University
Dr. Teresa Genevieve Wojcik, Villanova University
A Way to Win: Incentivizing Engineering Faculty to Incorporate Entrepreneurship in Their Courses
Dr. Adam R. Carberry, Arizona State University
Dr. Samantha Ruth Brunhaver, Arizona State University, Polytechnic campus
Dr. Jeremy S. London, Arizona State University, Polytechnic campus
Beyond Problem Solving to Creating Value: A Priority for Engineering Educators
Dr. William A. Kline, Rose-Hulman Institute of Technology
Dr. Doug E. Melton, Kern Family Foundation

M525 - Environmental Engineering Division Technical Session 2
3:15 p.m. - 4:45 p.m., Room 355 C, Convention Center - Salt Palace
Sponsor: Environmental Engineering Division
Moderator: Sanjay Tewari, Louisiana Tech University

Collaboration in Assessment and Individual Validation for the ‘Digital Native’
Capt. Nathaniel P. Sheehan, United States Military Academy
Col. Jeffrey A. Starke, United States Military Academy
Major David C. Zgonc, United States Military Academy
Environmental Considerations in Engineering: Students’ Goals and Journeys
Dr. Angela R. Bielefeldt, University of Colorado, Boulder
Dr. Greg Rulifson P.E., Colorado School of Mines
Informing an Environmental Ethic in Future Leaders Through an

M528 - Developing Teaching and Mentoring Skills
3:15 p.m. - 4:45 p.m., Room 150 G, Convention Center - Salt Palace
Sponsor: Graduate Studies Division
Moderator: Bradley Brummel, University of Tulsa
Papers related to the development of teaching and mentoring skills among graduate students and their faculty mentors.

Schedule subject to change: Please go to www.asee.org/icp for up to date information
A Doctoral Teaching Program in Engineering
Dr. Donald P. Visco Jr., University of Akron
Nidaa Makki
Ms. Esther R. Wain-Weiss, University of Akron
Graduate Student Self and Adviser Ratings on Professional Competencies
Mr. Bret Austin Arnold, University of Tulsa
Alison J. Kerr, University of Tulsa
Dr. Bradley J. Brummel, University of Tulsa
Dr. Michael W. Keller, University of Tulsa
Integrative Engineering Leadership Initiative for Teaching Excellence (iELITE)
Hyun Hannah Choi, University of Illinois, Urbana-Champaign
Prof. Yuting W. Chen, University of Illinois at Urbana-Champaign
Dr. A. Mattox Beckman Jr., University of Illinois, Urbana-Champaign
Mr. Lucas Anderson, University of Illinois at Urbana-Champaign
Dr. Blake Everett Johnson, University of Illinois, Urbana-Champaign
Dr. Matthew D. Goodman, University of Illinois, Urbana-Champaign
Chris Migotsky, University of Illinois
Ms. Nicole Johnson-Glauch
Lessons Learned from a Chemical Engineering REU: The Importance of Training Graduate Students Who are Supervising REU Students
Joseph C. Tise, Pennsylvania State University
Ms. Kirsten Susan Hochstedt, Pennsylvania State University
Dr. Sarah E. Zappe, Pennsylvania State University
Dr. Esther W. Gomez, Pennsylvania State University
Manish Kumar
When the Master Becomes the Student: Adviser Development through Graduate Advising
Alison J. Kerr, University of Tulsa
Dr. Bradley J. Brummel, University of Tulsa
Mr. Bret Austin Arnold, University of Tulsa
Dr. Michael W. Keller, University of Tulsa

Dr. Manuel D. Rossetti, University of Arkansas
Dr. Kim LaScola Needy, University of Arkansas
Mr. Eric Specking, University of Arkansas
Mr. Trevor Joe Dodson, University of Arkansas
International Student Recruiting and Retention in Post-graduate STEM Education
Mr. Andres Alejandro Herrera, University of Arkansas
Mr. Eric Specking, University of Arkansas
Dr. Richard Ham, University of Arkansas
The Effectiveness of an On-campus Open House Targeting Underrepresented Students
Dr. La’Tonia Stiner-Jones, Ohio State University
Supportive Interventions for the Success of URM Students in STEM Graduate Programs
Mrs. Shabnam Etemadi Brady, Tennessee State University
Miss Germysha Emily Little, Tennessee State University
Dr. Lesia L. Crompton-Young, Tennessee State University

M528B - Graduate Recruitment and Retention
3:15 p.m. - 4:45 p.m., Room 151 D, Convention Center - Salt Palace
Sponsor: Graduate Studies Division
Moderator: La’Tonia Stiner-Jones, Ohio State University
Papers related to the recruitment, admission, and success of graduate students in engineering.
Identifying the Best Admission Criteria for Data Science Using Machine Learning
Dr. Anahita Zarei, University of the Pacific
Richard Hutley, University of the Pacific
Effectiveness of GRE Workshops to Increase Awareness
Mr. Colby Weishaar, University of Arkansas

M529 - Industrial Engineering Division Town Hall Business Meeting
3:15 p.m. - 4:45 p.m., Room 250 B, Convention Center - Salt Palace
Sponsor: Industrial Engineering Division

M530 - Topics in Computing and Information Technology-II
3:15 p.m. - 4:45 p.m., Room 151 B, Convention Center - Salt Palace
Sponsor: Computing and Information Technology Division
Moderators: Belle Wei, San Jose State University; Arshia Khan, University of Minnesota Duluth
Applied Computing for Behavioral and Social Sciences (ACBSS) Minor
Dr. Farshid Marbouti, San Jose State University
Dr. Valerie A. Carr, San Jose State University
Prof. Belle Wei, San Jose State University
Morris E. Jones Jr., San Jose State University
Dr. Amy Strage
Does Everyone Use Computational Thinking?: A Case Study of Art and Computer Science Majors
Mr. Andreas Febrian, Utah State University
Dr. Oenardi Lawanto, Utah State University
Kamyn Peterson-Rucker
Alia Melvin
Mr. Shane E. Guymon
Cloud Application Monitoring for Efficient Network Management in Public Schools
Dr. John Pickard, East Carolina University
Mr. Dale Drummond, East Carolina University
Dr. Philip J. Lunsford II, East Carolina University
Ciprian Popoviciu, Nephos6, Inc.
Encouraging Women in CS I: Interventional Inclusive Pedagogy in Computer Science
Dr. Arshia Khan, University of Minnesota, Duluth

Schedule subject to change: Please go to www.asee.org/icp for up to date information
Conference Sessions

M530B - Computing Technology Applications-II
3:15 p.m. - 4:45 p.m., Room 150 F, Convention Center - Salt Palace
Sponsor: Computing and Information Technology Division
Moderators: Vuk Marojevic, Virginia Tech; Tamer Omar, California State Polytechnic University, Pomona

P2P Platform for Peer Instruction in Flipped Classroom
Dr. Yun Dai, University of Southern California
Tianmeng Li, University of New South Wales
Dr. Ang Liu, University of New South Wales
Dr. Stephen Lu, University of Southern California

Development of Undergraduate Interdisciplinary Cybersecurity
Program: A Literature Survey
Dr. Tamer Omar, California State Polytechnic University, Pomona
Dr. Srikanth Venkatesan, California State Polytechnic University, Pomona
Dr. AbdelFattah Amamra, California State Polytechnic University, Pomona

A Practical Approach to Cellular Communications Standards Education
Dr. Vuk Marojevic, Virginia Tech
Dr. Antoni Gelonch-Bosch, Universitat Politècnica de Catalunya
Dr. Jeffrey Reed, Virginia Tech

A Flipped Active-learning Class to Support Diverse Students in a Large Introduction to Programming Class
Prof. Laura Kay Dillon, Michigan State University
Ms. Michelle Slattery, Peak Research

M531 - Instrumentation Division Technical Session 2
3:15 p.m. - 4:45 p.m., Room 151 G, Convention Center - Salt Palace
Sponsor: Instrumentation Division
Moderators: Akram Hossain, Purdue University Northwest; Masoud Fathizadeh, Purdue University Northwest

Developing PLC-based Pneumatic Lab Activities for an Undergraduate Course on Fluid Power
Dr. Ali Alavizadeh, Purdue University Northwest
Dr. Maged Mikhail, Purdue University Northwest

Developing a Radio Frequency Identification (RFID) as a Decision Support System in Horticulture Industry
Dr. Lash B. Mapa, Purdue University Northwest
Feroja Goni, Purdue University Northwest
Ms. Sadia Alam
Dr. Gokarna Aryal, Purdue University Northwest

Framework to Develop the Customized Tool for RFID Experiment
Dr. Tae-Hoon Kim, Purdue University Northwest
Dr. Lash B. Mapa, Purdue University Northwest
Miss Min Hye Jun, Dongduk Women's University

Design and Development of a Supervisory Control and Data Acquisition (SCADA) Laboratory

M532 - Why Can't We Get Faculty and Students to Go Abroad?
3:15 p.m. - 4:45 p.m., Room 355 A, Convention Center - Salt Palace
Sponsor: International Division
Moderators: Homero Murzi, Virginia Tech; Scott Daniel, Swinburne University of Technology

The papers in this session are intended to stimulate a discussion about the problem that students and faculty resist getting involved in international activities. Attendee participation in the discussion is encouraged. Please come!

Sustaining a Study Abroad Program at Scale: What Motivates Faculty Members to Engage in Such Programs?
Dr. David B. Knight, Virginia Tech
Dr. Holly M. Matusovich, Virginia Tech
Ms. Mayra S. Artiles, Virginia Tech
Ms. Kirsten Davis, Virginia Tech
Dr. Timothy Kinoshita, Virginia Tech
Dr. Diana Bairaktarova, Virginia Tech
Kacie Hodges P.E., Virginia Tech
Prof. Tamara Knott, Virginia Tech
Dr. Walter C. Lee, Virginia Tech
Marlena McGlothlin Lester, Virginia Tech
Dr. Lisa D. McNair, Virginia Tech
Dr. Kenneth Reid, Virginia Tech
Dr. Denise Rutledge Simmons P.E., Virginia Tech

Understanding Engineering and Technology Student Perceptions: Barriers to Study Abroad Participation
Dr. Gregg Morris Warnick, Brigham Young University
Mrs. Marie S. Call, Brigham Young University
Dr. Randall Davies, Brigham Young University

Internationalization Tool for the U.S. Universities
Prof. José Carlos Quadrado P.E., ISEP-Instituto Superior de Engenharia do Porto

M533A - Elementary Engineering
3:15 p.m. - 4:45 p.m., Room 257 A, Convention Center - Salt Palace
Sponsor: Pre-College Engineering Education Division
Moderators: Jamie Gurganus, University of Maryland, Baltimore

Dr. Faruk Yildiz, Sam Houston State University
James Holekamp, Sam Houston State University
Dr. Reg Recayi Pecen, Sam Houston State University
Dr. Umit Karabiyik, Sam Houston State University
Mr. Keith L. Coogler, Sam Houston State University
Mr. Jeremy Ryan England

Design, Development, and Testing of Load Cell Accelerometers
Dr. Dale H. Litwhiler, Pennsylvania State University, Berks Campus

STEM Education Internship Program
Dr. Asad Yousuf, Savannah State University
Dr. Mohamad A. Mustafa, Savannah State University
Dr. Mir M. Hayden, Savannah State University
Mr. Alberto G. De La Cruz
Dr. Kisha Renee Cunningham

Schedule subject to change: Please go to www.asee.org/icp for up to date information
Monday, June 25

Conference Sessions

M533B - Program Evaluation Studies
3:15 p.m. - 4:45 p.m., Room 258, Convention Center - Salt Palace
Sponsor: Pre-College Engineering Education Division
Moderator: Karen Miel, Tufts University
This session focuses on evaluation studies of engineering education programs.

Bowman Creek Academy: An Immersive STEM Experience (Work in Progress)
Ms. Sara Boukldad, Bowman Creek Educational Ecosystem
Mrs. Amy Blue Cuevas, Bowman Creek Educational Ecosystem
Marty Kennedy

Elements that Support and Hinder the Development and Implementation of a School-wide/District-wide STEM Integration Program (Evaluation)
Dr. Mia Dubosarsky, Worcester Polytechnic Institute
Dr. Jeanne H. Hubelbank, Worcester Polytechnic Institute
Evaluation of the 2017 National Summer Transportation Institute Hosted at Rowan University

Dr. Ayman Ali,
Dr. Yusuf A. Mehta, Rowan University
Miss Shivani Dharmavir Patel, New Jersey Department of Transportation
Impact of an Engineering Service Learning Program on Dual Credit High School Student Interests in Engineering (Evaluation)
Ms. J. Jill Rogers, University of Arizona
Dr. Amy Annette Rogers, Delaware State University

M533C - Modeling, Inquiry, Engineering Literacy and Argumentation
3:15 p.m. - 4:45 p.m., Room 259, Convention Center - Salt Palace
Sponsor: Pre-College Engineering Education Division
Moderator: Marcelo Caplan, Columbia College
This diverse session considers pre-college engineering education from various stances.

Argumentation in K-12 Engineering Education: A Review of the Literature (Fundamental)
Dr. Amy Wilson-Lopez, Utah State University
Ms. Christina Marie Sias, Utah State University
Ashley R. Strong
Jared W. Garlick, Utah State University
Dr. Angela Minichielo P.E., Utah State University
Jorge Americo Acosta Feliz, Utah State University
Sandra Weingart

Determining the Engineering Knowledge Dimension: What all High School Students Should Know to be Engineering Literate (Fundamental)
Dr. Tanner J. Huffman, College of New Jersey
Dr. Greg J. Strimel, Purdue Polytechnic Institute
Dr. Michael Grubbs, Baltimore County Public Schools

Effective Design-based Implementation Research Using Complex Systems Modeling (Fundamental)
Roxanne A. Moore, Georgia Institute of Technology
Dr. Michael Helms, Georgia Institute of Technology
Dr. Marion Usselman, Georgia Institute of Technology
From Physics to Where? Diagnosing the Effect of a Discovery-based Teaching Paradigm on Continued Barriers to Women's Entry to the Physical Engineering Science Professions (RTP, Diversity)
Prof. Katherina V. Tamai-Lokhorst, Camosun College

M534 - 2018 Interdivisional Town Hall Meeting: Who's in the Driver's Seat of Engineering Education?
3:15 p.m. - 4:45 p.m., Grand Ballroom J, Convention Center - Salt Palace
Sponsors: Liberal Education/Engineering & Society Division;
Aerospace Division; ASEE Board of Directors; Biological and Agricultural Engineering Division; Chemical Engineering Division;
Biomedical Engineering Division; College Industry Partnerships Division; Community Engagement Division; Computers in Education Division; Computing and Information Technology Division; Construction Engineering Division; Continuing Professional Development Division; Design in Engineering Education Division; Cooperative and Experiential Education Division; Educational Research and Methods Division; Energy Conversion and Conservation Division; Engineering and Public Policy Division; Engineering Design Graphics Division; Engineering Deans Council; Engineering Libraries Division; Engineering Management Division; Engineering Physics and Physics Division; Entrepreneurship & Engineering Innovation Division; Manufacturing Division; Mathematics Division; Mechanical
During this 90-minute interactive session, everyone will have an opportunity to share their experiences in transforming educational programs, standards, and the assessment tools we use to bring about educational improvement and transformation.

Atsushi Akera (LEES)
Dr. Magesh Chandramouli, Purdue University Northwest
Dr. Jimmy Ching-Ming Chen, Wayne State University
Dr. Y. Gene Liao, Wayne State University
Dr. Ismail Fidan, Tennessee Technological University
Mr. Astrit Imeri, Tennessee Technological University
Mr. John Fraley, Tennessee Technological University
Mr. Alan R. Lecz, Washtenaw Community College
Prof. CP Yeh
Mr. Brandon Roderick Tucker, Washtenaw Community College
Mr. Alan R. Lecz, Washtenaw Community College

We invite members from all ASEE divisions to join us for this event.

M535 - Virtual Reality, Simulation, and Optimization of Manufacturing
3:15 p.m. - 4:45 p.m., Room 260 B, Convention Center - Salt Palace
Sponsor: Manufacturing Division
Moderators: Dawn Wendell, Massachusetts Institute of Technology; Arif Sirinterlikci, Robert Morris University

Virtual Reality, Simulation and Optimization of Manufacturing
A Comparative Study on Affordable Photogrammetry Tools
Mr. John Fraley, Tennessee Technological University
Mr. Astrit Imeri, Tennessee Technological University
Dr. Ismail Fidan, Tennessee Technological University
Dr. Magesh Chandramouli, Purdue University Northwest

Preparing Tomorrow's Workforce in Lightweight Materials:
Properties, Optimization and Manufacturing Processes
Dr. Jimmy Ching-Ming Chen, Wayne State University
Dr. Y. Gene Liao, Wayne State University
Prof. CP Yeh
Mr. Brandon Roderick Tucker, Washtenaw Community College
Mr. Alan R. Lecz, Washtenaw Community College

Virtual Reality Education Modules for Digital Manufacturing Instruction
Dr. Magesh Chandramouli, Purdue University Northwest
Monday, June 25

Conference Sessions

Dr. Ge Jin, Purdue University Northwest
Mr. Justin David Heffron, Purdue University Northwest
Dr. Ismail Fidan, Tennessee Technological University
Dr. Mel Cossette, Edmonds Community College
Cheryl A. Welsh, Eastern Iowa Community College
Wayne Merrell

M537 - Mathematics Division Technical Session 3
3:15 p.m. - 4:45 p.m., Room 155 C, Convention Center - Salt Palace
Sponsor: Mathematics Division
Moderator: Doug Bullock, Boise State University

Flipping the Differential Equations Classroom: Changes Over Time
Ms. Campbell R. Bego P.E., University of Louisville
Dr. Patricia A. Rañston, University of Louisville
Dr. Angela Thompson P.E., University of Louisville
Mrs. Adrienne Parsons, University of Louisville
Gale J. Crush, University of Louisville, Speed Scientific School

Demystifying Tensors: a Friendly Approach for Students of All Disciplines
John W. Sanders, California State University, Fullerton

How to Make Engineering Statistics More Appealing to Millennial Students
Dr. Robert G. Batson P.E., University of Alabama

Infusion of Big Data Concepts Across the Undergraduate Computer Science Mathematics and Statistics Curriculum
Dr. Carl Pettis, Alabama State University
Dr. Rajendra Swamidurai, Alabama State University
Prof. Ash Abebe, Auburn University
Dr. David Shannon, Auburn University

Conceptual Power Series Knowledge of STEM Majors
Dr. Emre Tokgoz, Quinnipiac University

Coordinate Transforms and Dual Bases: a Teaching Aid for Undergraduate Engineering Students
Dr. Günter Bischof, Joanneum University of Applied Sciences
Benjamin Edelbauer, Joanneum University of Applied Sciences

M538 - Mechanical Engineering Division Technical Session 3
3:15 p.m. - 4:45 p.m., Room 255 B, Convention Center - Salt Palace
Sponsor: Mechanical Engineering Division
Moderator: Thomas DeNucci, U.S. Coast Guard Academy

Improving Instruction and Assessment via Bloom’s Taxonomy and Descriptive Rubrics
Dr. Kathryn R. Gosselin, San Jose State University
Dr. Nicole Okamoto, San Jose State University

High-Enrollment Mechanical Engineering Programs Meeting the Challenge of Career Advising Through a Seminar Course
Ms. Rachael E Thomassie, Texas A&M University
Kathryn Kirsch, Pennsylvania State University
Dr. Eric R Marsh, Pennsylvania State University, University Park
Dr. Timothy J. Jacobs, Texas A&M University

On the Restructuring of the Undergraduate Mechanical Engineering Curriculum for Quarter to Semester Conversion
Dr. Pattabhi Sitaram, Baker College, Flint, Michigan
Dr. Anca L. Sala, Baker College, Flint

Course and Standardized Exam Statistics in Mechanical Engineering
Dr. Jessica Lofton, University of Evansville
Dr. Jared T. Fulcher, University of Evansville
Dr. Dick Blandford, University of Evansville

Critical Analysis of the Validity of the Fundamentals of Engineering Mechanical Exam
Dr. Alex C. Szatmary, King’s College

M540 - Minorities in Engineering Division Technical Session 3
3:15 p.m. - 4:45 p.m., Room 155 E, Convention Center - Salt Palace
Sponsor: Minorities in Engineering Division
Moderators: Kristin Imhoff, Drexel University; David Delaine, Ohio State University

Outreach Activities and Experiences
Investment in Informal Outreach Programs: A Systematized Literature Review of Informal Pre-College STEM Programs in African-American Communities
Mrs. Jessica Rush Leeker, Purdue University, West Lafayette (College of Engineering)

Examining the Engineering Attitudes and Experiences of URM Summer Camp Participants
Miss Jessica Symone Whipple, Kennesaw State University
Dr. Hide Prater, University of Michigan

Filling the Pipeline by Exciting Middle School Girls with Creative Projects
Meghan Charlotte Kubowski, Loyola Marymount University
Ms. Mackenzie Tjogas, Loyola Marymount University
Miss Carleen Petrosian

M541 - Multidisciplinary Design II
3:15 p.m. - 4:45 p.m., Room 155 A, Convention Center - Salt Palace
Sponsor: Multidisciplinary Engineering Division
Moderators: Kosta Popovic, Rose-Hulman Institute of Technology; David Che, Mount Vernon Nazarene College

Schedule subject to change: Please go to www.asee.org/icp for up to date information
Monday, June 25

Conference Sessions

**M542A - Scaling Class Size and Technology – New Engineering Educators Division**
1:30 p.m. - 4:45 p.m., Room 151 E, Convention Center - Salt Palace

**Sponsor:** New Engineering Educators Division

**Moderator:** Derek Breid, Saint Vincent College

**Delve into strategies to maximize student success as class sizes increase.**

**Team-based Architectural Engineering Capstone**
- Dr. Ryan L. Solonsky P.E., Pennsylvania State University, University Park
- Prof. Moses Ling, Pennsylvania State University, University Park
- Prof. M. K. Parfit

**Preparation of the Professional Engineer: Outcomes from 20 Years of a Multidisciplinary and Cross-sectoral Capstone Course**
- Dr. Tela Favaloro, University of California, Santa Cruz
- Dr. Patrick E. Mantey, University of California, Santa Cruz
- Mr. Stephen C. Petersen P.E., University of California, Santa Cruz
- Prof. John F. Vesecky, University of California, Santa Cruz

**A Review of Electronic Engineering Logbooks Throughout the Electrical Engineering Curriculum**
- Dr. Steven S. Holland, Milwaukee School of Engineering
- Dr. Jennifer L. Bonniwell, Milwaukee School of Engineering
- Dr. Joshua David Carl, Milwaukee School of Engineering

**Curriculum and Instruction Basics for the New Engineering Educator**
- Prof. Michael Allen Hayden Ph.D., Indiana State University
- Dr. Randell W. Peters, Indiana State University

**A Corporate Organizational Model for Scaling Class Size**
- Dr. Geoffrey Recktenwald, Michigan State University
- Dr. Allison Godwin, Purdue University-Main Campus, West Lafayette (College of Engineering)
- Prof. Anant Sahai, University of California, Berkeley
- Prof. Matthew West, University of Illinois, Urbana-Champaign

**Failure Rates in Engineering: Does It Have to Do with Class Size?**
- Dr. Peggy C. Boylan-Ashraf, San Jose State University
- Mr. John R. Haughey, Iowa State University

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**M542B - Getting Your Career Off to a Good Start**
3:15 p.m. - 4:45 p.m., Room 150 E, Convention Center - Salt Palace

**Sponsor:** New Engineering Educators Division

**Moderator:** Jennifer Keshwani, University of Nebraska, Lincoln

**Speakers:**
- Dr. Richard M. Felder, North Carolina State University
- Dr. Rebecca Brent, Education Designs, Inc.
- Dr. Phillip C. Wankat, Purdue University-Main Campus, West Lafayette (College of Engineering)

**Panelists:**
- Dr. Richard M. Felder
- Dr. Rebecca Brent, President, Education Designs, Inc., Chapel Hill, N.C.
- Dr. Phillip C. Wankat
- Clifton L. Lovell Distinguished Professor Emeritus of Chemical Engineering and of Engineering Education
- Purdue University

**Mrs. Dr. Brent and Felder are coauthors of Teaching and Learning STEM: A Practical Guide (Jossey-Bass, 2016), and Dr. Felder was the inaugural recipient of the ASEE Lifetime Achievement Award for contributions to engineering education. Dr. Wankat is the coauthor of Teaching Engineering (2nd Edn., Purdue University Press, 2015) and of The Effective, Efficient Professor: Teaching, Scholarship, Service (Pearson, 2001).**

**Drs. Felder and Wankat have also written widely used engineering textbooks, and all three panelists are Fellow Members of ASEE.**

**Abstract**

The session will begin with short introductory remarks from each panelist. Dr. Brent will describe how new faculty members can get good mentoring in teaching, research, and their campus culture; Dr. Felder will outline effective ways to avoid several common mistakes new faculty members make that slow their progress to tenure and promotion; and Dr. Wankat will discuss Murphy’s law (“Anything that can go wrong will go wrong”) and O’Toole’s commentary on Murphy’s law (“Murphy was an optimist”), with examples from his career. The session participants will then work together to generate questions and concerns related to their careers that the panelists will discuss.

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**M544 - Ocean and Marine Division Business Meeting**
3:30 p.m. - 4:45 p.m., Room 250 D, Convention Center - Salt Palace

**Sponsor:** Ocean and Marine Division

**Business meeting**

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**M549 - Technological and Engineering Literacy/Philosophy of Engineering Division Technical Session 2**
3:15 p.m. - 4:45 p.m., Room 155 D, Convention Center - Salt Palace

**Sponsor:** Technological and Engineering Literacy/Philosophy of Engineering Division

Schedule subject to change: Please go to [www.assee.org/icp](http://www.assee.org/icp) for up to date information.
Monday, June 25

M550 - Two-year College STEM Programs Meeting the Needs of Industry
3:15 p.m. - 4:45 p.m., Room 254 B, Convention Center - Salt Palace
Sponsor: Two-Year College Division
Moderator: Dominic Dal Bello, Allan Hancock College
Different approaches two-year college STEM programs take to meet the demands of a modern workforce.

Evaluating the Quality of Project Summaries for S-STEM Proposals
Dr. Yvette E. Pearson P.E., Rice University
Dr. Canek Moises Luna Phillips, Rice University
Dr. Margaret E. Beier, Rice University
Ms. Jacqueline Gilberto, Prof. Stephen P. Mattingly, University of Texas, Arlington
Dr. Ann Saterbak, Duke University
Ms. Yuting Sheng, Rice University
Anila K. Shethia, Rice University
Rui (Roy) Sun, Rice University

A Model for Aligning Engineering Technology Curriculum with Industry Needs
Dr. David L. Spang, Rowan College at Burlington County
Dr. Eric Constans, Rowan University
Dr. Edem G. Tetteh, Rowan College at Burlington County

Meeting STEM Workforce Demand in a Statewide Rural Community College Collaborative
Caroline VanIngen-Dunn, Science Foundation Arizona
Dr. Phil Blake McBride, Eastern Arizona College
Ms. Cynthia Kay Pickering, Science Foundation Arizona
Dr. Verlyn Fick, Cochise College
Ms. Judith M. Slisz, Judith Slisz Consulting
Mr. John Morgan, Yavapai College

From Entry to Employment: Interlocking Keys to Building a Successful Technician Program
Mr. Randy Libros, Community College of Philadelphia
Dr. Tammy Wooten
Dr. Mozghan Bahadori

M551 - Strategies for Success and Sanity for Academic Parents
3:15 p.m. - 4:45 p.m., Room 355 D, Convention Center - Salt Palace
Sponsor: Women in Engineering Division
Moderator: Pamela Dickrell, University of Florida
Speaker: Dr. Kaitlin Mallouk, Rowan University
Summary of Ideas to be Explored and Discussed:
Raising children is one of the most challenging and opportunity-filled experiences most people will take on in their lives. Raising children as a member of the academy brings an additional layer of complexity.

This panel will present challenges and opportunities encountered by the panelists while raising children and trying to succeed in academia. The panelists will also provide concrete, achievable strategies that have worked for them to overcome those hurdles and how they have leveraged the opportunities available to them. The session will allow time for Q&A during which audience members can share their own challenges and success strategies with the broader group.

Some possible topics include:
- Emotional demands of parenting
- Timing the birth or adoption of children
- Traveling for work with children
- Succeeding on the tenure track with children
- Balancing the demands of children and a challenging job

Outline of the session format:
The first third of the session will be dedicated to panelists sharing their top challenges and best strategies for success and sanity as academic parents. The remaining two-thirds of the session will allow audience members to pose their personal challenges to the panel and the rest of the audience to receive relevant feedback. To encourage and guide audience participation, we will ask members of the audience to first think about the challenges they’ve encountered at various parental stages including prior to having children, while parenting small children, and while parenting older children. We will then have members of the audience discuss their experiences in small groups. Finally, we will encourage sharing with the audience at large.

Vision for panelists:
We plan to include five panelists with diverse experiences, including people who:
• Have small children while on the tenure-track
• Have older children while on the tenure-track
• Have achieved tenure with children
• Have adopted children
• Had children during graduate school
• Had children post-tenure
• Are international citizens

Expected outcomes for the session:
We expect that people who attend this panel session will leave with concrete strategies that they can use to make their lives as engineering educators and parents easier. We also expect that attendees will leave with a sense of camaraderie that is often lacking while parenting today. Finally, we believe that this panel could serve as a starting point for new engineering educators to create a supportive network of individuals facing similar life circumstances that they may turn to in the future.

Panel: Strategies for Success and Sanity for Academic Parents
Dr. Kaitlin Mallouk, Rowan University

M551B - Women in Engineering Division Technical Session 2
3:15 p.m. - 4:45 p.m., Room 255 A, Convention Center - Salt Palace
Sponsor: Women in Engineering Division
Moderator: Zareena Gani, Higher Colleges of Technology

A Systematic Literature Review of the Impact of Undergraduate...
Conference Sessions

Monday, June 25

M556 - Military and Veterans Division Technical Session 2: Veteran Identity & Inclusion
3:15 p.m. - 4:45 p.m., Room 255 C, Convention Center - Salt Palace
Sponsor: Military and Veterans Division
Moderator: Landon Raby
This session contains papers discussing topics related to veterans and their identity and inclusion into the academic-social environment.

Factors Influencing Student Veteran Participation in Online Engineering Education
Dr. Douglas Moore Schutz, Tokyo University of Science
Prof. Yong-Young Kim P.E., Konkuk University
Dr. Dante Dionne, Korean Air

Integrating Veteran Experiences into Engineering Design: Veteran-led Student Development of High-power Rocket Competition Team
Thomas L. Davis, Kent State University
Dr. D. Blake Stringer, Kent State University
Maureen Reagan McFarland, Kent State University

Reaching and Including Veteran Students in the Technical Communication Classroom
Dr. Alyson Grace Eggleson, The Citadel
Dr. Robert J. Rabb P.E., The Citadel

I Never Played the 'Girl Card': Experiences and Identity Intersections of Women Veteran Students in Engineering
Rebecca C. Atkinson, Clemson University
Dr. Catherine Mobley, Clemson University
Dr. Catherine E. Brawner, Research Triangle Educational Consultants
Dr. Susan M. Lord, University of San Diego
Michelle M. Camacho, University of San Diego
Dr. Joyce B. Main, Purdue University, West Lafayette

M580 - Faculty Development Constituency Committee Business Meeting
3:15 p.m. - 4:45 p.m., Room 250 C, Convention Center - Salt Palace
Sponsor: Faculty Development Constituency Committee
Everyone is welcome to come join the Faculty Development Constituency Committee at its annual business meeting. Faculty development—the continuing education of educators—plays a key role in fostering a strong community of engineering educators and translating engineering education research into practice. This constituency committee is devoted to advancing the practice and scholarship of faculty development, as well as advancing the various professions that formally or informally support engineering educators’ growth.

M6109 - New This Year! Texas Instruments Robotics Pavilion
5:00 p.m. - 6:00 p.m., Exhibit Hall A & C, Convention Center - Salt Palace
Sponsor: Sponsored Sessions
Check out TI’s robotics pavilion #1031 for live robotics demos and challenges!
Sunday, June 25th: DSTR Robot from 6 – 7:30 p.m.
Monday, June 26th: TI-RSLK from 5 – 6 p.m.
Tuesday, June 27th: TI-Innovator™ Rover from 11:30 a.m. – 1 p.m.

M696 - FOCUS ON EXHIBITS: Summertime Social
5:30 p.m. - 5:50 p.m., Exhibit Hall A B & C, Convention Center - Salt Palace
Sponsor: ASEE Headquarters
Nothing says summer like a refreshing glass of sweet, cold lemonade. Escape the hot June temps and see what's “hot” on the Exhibit Hall Floor.
This event is complimentary for all attendees.

M196D - JEE Pop-Up Workshops
5:30 p.m. - 5:50 p.m., South Foyer, Convention Center - Salt Palace
Sponsor: ASEE Headquarters
The editorial board of the Journal of Engineering Education (JEE) is offering a series of short pop-up workshops to work directly with current and potential authors and reviewers. The workshops will focus on two themes: “How to Be a Star Reviewer” and “How to Get Your Manuscript Through the Review Process Faster.” The times for these pop-up workshops will be Monday 5:30 – 5:50 p.m. and Tuesday 12:00 – 12:20 p.m. Information on the dates and times of these workshops will also be available at the ASEE booth in the exhibit hall.

M704 - BME Division Social and Awards Dinner
7:00 p.m. - 9:00 p.m., Offsite, Squatters Brewery & Pub, 147 West Broadway
(300 South) Salt Lake City, UT 84010
Sponsor: Biomedical Engineering Division
The ASEE BME Division Social is an opportunity to interact with your BME colleagues in an informal atmosphere at a local restaurant. We also will present the winners of the Theo Pilkington Award, Biomedical Engineering Teaching Award, and Best Paper Award. We hope to see you there!
Ticketed event: $65.00 advanced registration and $75.00 on site registration.

M705 - Chemical Engineering Division Awards

Schedule subject to change: Please go to www.asee.org/icp for up to date information
Banquet
7:00 p.m. - 9:00 p.m., Offsite, Cucina Toscana, 282 S 300 W
Salt Lake City, UT 84101
Sponsor: Chemical Engineering Division
Annual Chemical Engineering Division awards banquet. Join us for the presentation of this year's ChE Division awards.
Ticketed event: $60.00 advanced registration and $70.00 on site registration

M706 - Civil Engineering Division RAP Session
6:00 p.m. - 8:00 p.m., Offsite, 326 S W Temple, Salt Lake City, UT 84101.
Note: must be at least 21. Sponsored by Villanova and Kiewit.
Sponsor: Civil Engineering Division
The annual RAP Session of the Civil Engineering Division provides members and guests of the division a chance to interact in an informal setting to discuss current and emerging topics. This will also serve as an reunion for ExCEEd graduates.
Free ticketed event

M7104 - McGraw/Berger Awards Banquet
7:00 p.m. - 9:00 p.m., Salon H, HQ Hotel - Marriott at City Creek
Sponsors: Engineering Technology Council; Engineering Technology Division
McGraw Award and Berger Award banquet
Ticketed event: $70.00 advanced registration and $80.00 on site registration

M7107 - Order of the Tattered Purple Badge – Past Presidents Dinner
7:00 p.m. - 9:00 p.m., The New Yorker, 60 West Market Street Salt Lake City, Utah 84101
Sponsor: Order of Tattered Purple Badges
Join Host Joe Rencis for the Order of the Tattered Purple Badge – Past Presidents Dinner
The New Yorker Restaurant
(801) 363-0166/Fax (801) 363-0588
newyorker@ginc.com
Ticketed event: $75.00 advanced registration and $85.00 on site registration

M7109A - Texas A&M Reception
6:00 p.m. - 7:30 p.m., Salon E, HQ Hotel - Marriott at City Creek
Sponsor: Sponsored Sessions
Please stop by to enjoy some great food, company, and ambiance, and learn more about the Texas A&M College of Engineering and what we're doing in order to enhance engineering education at every level.

M7109B - Sponsor Technical Session: A New IoT Curriculum for Freshman Through Senior Courses—Presented by STMicroelectronics
6:00 p.m. - 7:30 p.m., Room 150 A - Sponsor Tech Room, Convention Center - Salt Palace
Sponsor: Sponsored Sessions
Speakers: Chris Back, Xu Zhang, Yi Zheng, William Kaiser, Marco De Fazio, Giorgio Mariano
Electrical and Computer Engineering Department, University of California, Los Angeles
STMicroelectronics, Geneva, Switzerland
The Internet of Things (IoT) vision has been harnessed to develop a motivational curriculum with the objective of accelerating learning in this transformational new field of engineering. This IoT curriculum focuses on the technology and the broad societal impact of IoT with instruction and hands-on development. This is an open-source development with the objective of creation with an international community that will expand and shape the curriculum. Most importantly, an IoT platform integrating state-of-the-art processors, sensors, and wireless network interfaces is required. In partnership with STMicroelectronics, we have developed a curriculum based on the STMicroelectronics SensorTile IoT platform, providing an affordable kit for every student, along with open source, powerful development tools. Rapid immersion in C code development is designed to accelerate learning while developing an understanding of IoT technology and the SensorTile platform. Large classes of students in their first university session and without prior computing experience have been successful in hands-on project development missions. This presentation will describe the new curriculum, the SensorTile IoT platform, the tutorial sequence, new embedded machine learning tools, and methods that have been introduced for scaling enrollment to large class sizes. It can support every level from freshman courses through senior capstone design offerings.

M714 - FIE Executive session
6:00 p.m. - 9:00 p.m., Salon A, HQ Hotel - Marriott at City Creek
Sponsor: Educational Research and Methods Division
Closed meeting of the FIE Executive Board.

M721 - ELD Welcome Reception
6:00 p.m. - 9:00 p.m., Offsite, Located about 4 blocks/10 minute walk from the convention center. The private room we will be using is Vivace.
Sponsor: Engineering Libraries Division
The ELD Welcome Reception will be held at Cucina Toscana on Monday, June 25 from 6-9 pm. Thanks to the generous support of IEEE, the reception is free to all ELD members. More information, including information about signing up for the reception will be distributed via the ELD list-serve.

M738 - ME Division Convivium
6:00 p.m. - 9:00 p.m., Offsite, Caffe Molise, 55 West 100 South
Sponsor: Mechanical Engineering Division
The convivium is the social highlight of the ME Division each year. This first-rate banquet is held off site, within walking distance of the convention center. Enjoy great food with ME Division friends old and new this year in Salt Lake City!
www.caffemolise.com
Drinks at 6 p.m., Dinner at 7 p.m.
Ticketed event: $20.00 advanced registration and $30.00 on site registration
M741 - Multidisciplinary Engineering Division Social
7:00 p.m. - 9:00 p.m., Offsite, Gracie's, 326 South West Temple
Sponsor: Multidisciplinary Engineering Division
Join Multidisciplinary Engineering members for an evening of merriment. Come share your ideas and experiences with multidisciplinary projects, courses, and programs. Beverages and appetizers will be provided. This event will be off site. Contact MULTI Program Chair AJ Hamlin (ahamlin@mtu.edu) for additional details.
Ticketed event: $10.00 advanced registration and $20.00 on site registration

M745 - Engineering and Public Policy Division Social Event
7:00 p.m. - 9:00 p.m., Offsite, J. Wong's Asian Bistro, 163 West 200 South Salt Lake City, UT 84101
Sponsor: Engineering Physics and Physics Division
This will be a great opportunity to meet other members in the field for networking and collaboration. Since this is an off-site event, we expect the cost to be typical for a conference dinner. Please help us determine the headcount, RSVP to tlarkin@american.edu.
Free ticketed event

M746 - Software Engineering Division Business Meeting
7:00 p.m. - 9:00 p.m., Salon B, HQ Hotel - Marriott at City Creek
Sponsor: Software Engineering Division
This business meeting is open to all interested in the Software Engineering Division (SWDIV). We will elect officers for any vacancies, obtain feedback about the conference, and plan next year's conference. Please join us after the business meeting for dinner at a local restaurant. Details will be discussed at the meeting. This event is open to all ASEE members interested in Software Engineering.

M747 - Student Division Dinner
7:00 p.m. - 9:00 p.m., Offsite, Finca, 327 W 200 S, Salt Lake City, Utah P: 801-487-0699
Sponsor: Student Division
An opportunity for the Student Division members to gather and discuss ideas. We will also have our award ceremony in this time.
Ticketed event: $10.00 advanced registration and $15.00 on site registration

M752 - Celebration of Engagement: Community Engagement Division Dinner
6:15 p.m. - 8:30 p.m., Offsite, Caffè Molise, 55 W 100 S, Salt Lake City, UT 84101 (801) 364-8833
Sponsor: Community Engagement Division
The ASEE Community Engagement Division dinner invites members and guests who are interested in community engagement to join us in this annual dinner. This will be a fun opportunity to connect with others who are building service into their everyday careers.

Caffè Molise www.caffemolise.com
Ticketed event: Community Engagement Social - $40.00 advanced registration and $50.00 on site registration

M755 - LEAD Division Social
6:00 p.m. - 8:00 p.m., Salon D, HQ Hotel - Marriott at City Creek
Sponsor: Engineering Leadership Development Division
Join the Engineering Leadership Development Division (LEAD) for a relaxed evening of socializing with food and drink. Meet the division leadership and learn about the growing field of engineering leadership development. Swap best practices of your leadership program or learn how to get started. Everyone is welcome. Light appetizers will be provided.
Free ticketed event

M793 - ASEE President's International Reception (By Invite Only)
6:00 p.m. - 7:30 p.m., Offsite, Presidential Suite, Marriott City Creek, Salt Lake City, UT
Sponsor: ASEE Board of Directors
ASEE president's International Reception (by invitation only).
Free ticketed event

M96 - ASEE Active! Group Walk/Run Event
6:30 a.m. - 7:30 a.m., Offsite, East Doors - Salt Palace Convention Center, West Temple and 200 South Avenue
Sponsor: ASEE Headquarters
Looking for people to run or walk outdoors with? Don’t know the local scene?
Meet up with your colleagues at the east doors of the Salt Palace Convention Center (West Temple and 200 South) at 6:30 a.m. and we'll head out on a group run/walk highlighting the State Capitol Building, Memory Grove Park, and City Creek Canyon. Pace and distance will be determined based on attendee preference; there will be at least one walking group and one running group available. All runners and walkers are welcome!
ASEE Active! is endorsed by the Ad Hoc Committee for Interdivisional Cooperation and the Connecting Us Team of the ASEE Board’s Strategic Doing initiative, and is focused on building community among ASEE members through participation in healthy recreational activities.
Free ticketed event

Schedule subject to change: Please go to www.asee.org/icp for up to date information
T196D - ASEE Registration Open
8:00 a.m. - 5:00 p.m., Exhibit Hall A B & C, Convention Center - Salt Palace
Sponsor: ASEE Headquarters

T196E - ASEE Exhibit Hall
8:00 a.m. - 3:00 p.m., Exhibit Hall A B & C, Convention Center - Salt Palace
Sponsor: ASEE Headquarters

T196H - ASEE Bistro Sponsored by Weber State University
8:45 a.m. - 5:00 p.m., Exhibit Hall A B & C, Convention Center - Salt Palace
Sponsor: ASEE Headquarters

T196C - ASEE’s Living Wall
8:00 a.m. - 5:00 p.m., Exhibit Hall Foyer, Convention Center - Salt Palace
Sponsor: ASEE Headquarters
We’re excited to bring back the ASEE Living Wall to the Annual Conference this year!
Each year at the conference, attendees will contribute their thoughts to the Wall by writing a response to a particular question or idea.
The Wall will be preserved and displayed from year to year, growing bigger and bigger, and serving as a historical document of our conference attendees’ insights, ruminations, and reflections.
We hope you’ll take a few moments to leave your legacy on the Wall, located near the Exhibit Hall.

T196A - Sunrise Gentle Yoga
7:00 a.m. - 7:45 a.m., South Foyer, Convention Center - Salt Palace
Sponsor: ASEE Headquarters
Join your friends and colleagues as we jump-start our day with a renewing stretch and meditation class!
(Mats and exercise clothes are not required.)

T96 - ASEE Active! Group Walk/Run Event
6:30 a.m. - 7:30 a.m., Offsite, East Doors - Salt Palace Convention Center, West Temple and 200 South Avenue
Sponsor: ASEE Headquarters
Looking for people to run or walk outdoors with? Don’t know the local scene?
Meet up with your colleagues at the east doors of the Salt Palace Convention Center (West Temple and 200 South) at 6:30 a.m. and we’ll head out on a group run/walk highlighting the State Capitol Building, Memory Grove Park, and City Creek Canyon. Pace and distance will be determined based on attendee preference; there will be at least one walking group and one running group available. All runners and walkers are welcome!
ASEE Active! is endorsed by the Ad Hoc Committee for Interdivisional Cooperation and the Connecting Us Team of the ASEE Board’s Strategic Doing initiative, and is focused on building community among ASEE members through participation in healthy recreational activities.

Free ticketed event.

T196B - Back by Popular Demand! Virtual Reality Experience
8:00 a.m. - 3:00 p.m., Exhibit Hall A B & C, Convention Center - Salt Palace
Sponsor: ASEE Headquarters
Get immersed in the latest Virtual Reality experience - located in the back of the Exhibit Hall.
myVRadventure was created with the goal of sharing interactive STEM-based activities and emerging technologies with as many impressionable and curious minds as possible.
Through our customizable services, we deliver an out-of-this-world, engaging experience, which brings people together using a unique blend of education, science, and entertainment.
At the 2018 ASEE conference, myVRadventure will be providing 4 Room-Scale VR Stations and 4 Seated VR Stations, allowing participants to choose among several different virtual experiences, including:
- The LAB – Curated, Interactive VR Experience
- Rec Room – Multiplayer, Interactive Questing and Exciting Team Building Adventure
- FORM – Mind Bending experience where the puzzles are built from dreams and ancient memories
- The Body VR: Journey Inside a Cell - An educational virtual reality experience that takes the user inside the human body for a tour of organs, vessels, cells and more
- Escape Room - Players are prompted to solve a series of challenging puzzles to escape from their office before a microchip in their head explodes.
- Apollo 11 VR – This is the story of the greatest journey ever taken by humankind. This VR experience is a recreation of the events which took place between July 16th and July 24th, 1969.
- Fantastic Contraption – A surreal, physics-based, building and engineering game for VR. Inside the game you must create life-sized contraptions to solve puzzles on the other side of an island.
- Tilt Brush – Write, draw, and create complex paintings in Virtual Reality. Perfect for Artists and creative minds alike
- Job Simulator - Take instructions from your robot masters in the exciting world of work
- The Blu – Interactive Underwater Tour. Experience the wonder and majesty of the ocean through a series of habitats and come face to face with some of the most awe-inspiring species on the planet.
- Google Spotlight Stories - Choice of short virtual animated shorts, including: Pearl, Special Delivery, Rain or Shine, Sonaria, Son of Jaguar. Fun and engaging for all ages
And more to come…
Each experience has been selected for its educational, entertainment value and length - keeping in mind that the time per experience per participant may be limited, depending on demand.
Event: 6/24/2018 Live demo - Reception 6 p.m.
Event: Monday 6/25/2018 Live demo - Reception 6 p.m.
Event: Monday 6/26/2018 Live demo - Reception 6 p.m.

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T103 - Biological and Agricultural Business Meeting
7:00 a.m. - 7:55 a.m., Room 250 E, Convention Center - Salt Palace
Sponsor: Biological and Agricultural Engineering Division
Biological and agricultural business meeting.

T104 - Hands-On Skills in BME
8:00 a.m. - 9:30 a.m., Room 155 B, Convention Center - Salt Palace
Sponsor: Biomedical Engineering Division
Moderator: Joseph Towles, University of Wisconsin, Madison
These presentations describe new ways that faculty have incorporated hands-on activities in BME classes.

Guided Modules Emphasizing Process-Based Troubleshooting Techniques Help Below-Average Performing Students Improve Instrumentation Skills
Dr. Renata Fortuna Ramos, Rice University
Connecting Theoretical Concepts to Physical Phenomena Using 3-D printed Microfluidic Devices
Dr. Sarah Ilkhanipour Rooney, University of Delaware
Mr. Peter A. Sariano, Mr. Zachary Aaron Sexton, University of Delaware
Mr. Wade Gerald Stewart, University of Delaware
Dr. Kevin R. Guidry, University of Delaware
Dr. Jason Gleghorn, University of Delaware
Teaching Genomics and Genomic Technologies to Biomedical Engineers: Building Skills for the Genomics World
Dr. Karen R. Thichman, University of Washington
Creating New Labs for an Existing Required Biomedical Engineering Imaging Course
Dr. Elizabeth Kathleen Bucholz, Duke University
Mr. Matthew Brown, Duke University Pratt School of Engineering, department of Biomedical Engineering

T105 - ChemE Curriculum: Freshman and Sophomore
8:00 a.m. - 9:30 a.m., Room 150 G, Convention Center - Salt Palace
Sponsor: Chemical Engineering Division
Moderator: Anthony Butterfield, University of Utah
Presentations highlight the freshman and sophomore years of the chemical engineering curriculum, focusing on the first-year experience and material and energy balances.

A Framework to Guide Design of Interactive and Constructive Learning Opportunities
Dr. Tracy Q. Gardner, Colorado School of Mines
Chemical Engineering Major Selection Throughout the First Year: A Mixed-Methods Approach
Ms. Katherine Rae Tanner, Ohio State University
Dr. Rachel Louis Kajfez, Ohio State University
Dr. Krista M Keckemety, Ohio State University
Quantifying Self-guided Repetition Within an Interactive Textbook

T106A - Civil Engineering Division Business Meeting
7:00 a.m. - 7:55 a.m., Room 254 A, Convention Center - Salt Palace
Sponsor: Civil Engineering Division
Annual business meeting of the Civil Engineering Division.

T106B - Educational & Professional Issues of Strategic Importance to the Civil Engineering Profession and ASCE
8:00 a.m. - 9:30 a.m., Room 254 A, Convention Center - Salt Palace
Sponsor: Civil Engineering Division
Moderators: Thomas Lenox, American Society of Civil Engineers;
James O’Brien, American Society of Civil Engineers

Celebrating 20 Years of the ExCEEd Teaching Workshop
Dr. Allen C. Estes, California Polytechnic State University, San Luis Obispo
Dr. Stephen J. Ressler P.E., United States Military Academy
Dr. Camilla M. Saviz P.E., University of the Pacific
Dr. Brock E. Barry, United States Military Academy
Ms. Carol L. Considine, Old Dominion University
Mr. Dion Coward, American Society of Civil Engineers
Dr. Norman D. Dennis Jr. P.E., University of Arkansas
Dr. Scott R. Hamilton P.E., York College of Pennsylvania
Dr. David S. Hurwitz, Oregon State University
Dr. Tanya Kunberger, Florida Gulf Coast University
Dr. Thomas A. Lenox, American Society of Civil Engineers (Retired)

Dr. Tonya Lynn Nilsson P.E., Santa Clara University
Ms. Leslie Nolen CAE, American Society of Civil Engineers
Mr. James J. O’Brien Jr., American Society of Civil Engineers
Dr. Robert James O’Neill, Florida Gulf Coast University
Dr. David A. Saftner, University of Minnesota, Duluth
Dr. Kelly Salyards P.E., Bucknell University
Dr. Ronald W. Welch P.E., The Citadel

Implementing Civil Engineering-specific Requirements for Professional Licensure
Dr. Matthew Swany P.E., Virginia Military Institute
Craig N. Musselman, A & E Consulting
Dr. Monte L. Phillips P.E., University of North Dakota
L. Robert Smith P.E., American Society of Civil Engineers
Dr. Robert James O’Neill Jr., American Society of Civil Engineers

Modeling Student Performance in an Introductory Chemical Engineering Course
Kyle Joe Branch, University of Utah
Prof. Anthony Butterfield, University of Utah

for a Material and Energy Balances Course
Prof. Matthew W. Liberatore, University of Toledo
Ms. Katherine Roach,

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Conference Sessions

Dr. Stephen J. Ressler P.E., United States Military Academy
Dr. Thomas A. Lenox, American Society of Civil Engineers (Retired)

Adjusting to the New ABET Criteria 3 and 5: It’s Really Not Very Hard
Dr. Allen C. Estes, California Polytechnic State University, San Luis Obispo
Dr. Pamelee A. Brady, California Polytechnic State University, San Luis Obispo
Dr. Peter Laursen,

The Third Edition of the Civil Engineering Body of Knowledge: An Update and Overview
Dr. Kenneth J. Fridley, University of Alabama
Dr. Decker B. Hains, Western Michigan University
Dr. Brock E. Barry P.E., United States Military Academy
Dr. Kristen L. Sanford Bernhardt, Lafayette College
Ms. Leslie Nolen CAE, American Society of Civil Engineers

Design of a Modular Educational Robotics Platform for Multidisciplinary Education
Zhen Wei, Dr. Carlotta A. Berry, Rose-Hulman Institute of Technology

Weekly Programs in a CS1 Class: Experiences with Auto-graded Many-small Programs (MSP)
Joe Michael Allen, University of California, Riverside
Prof. Frank Vahid, University of California, Riverside
Mrs. Kelly Downey, University of California, Riverside
Dr. Alex Daniel Edgcomb, Zybooks

Partnering to Develop Educational Software Applications: A Four-year Retrospective Study
Mr. David Kepping, Virginia Tech
Dr. John K. Estell, Ohio Northern University

Student Usage of Small Auto-graded MATLAB Coding Exercises
Dr. Alex Daniel Edgcomb, Zybooks
Dr. Nikitha Sambamurthy, Zybooks
Mr. Dasharath Gulvady, MathWorks
Santosh Kasula, MathWorks

T109 - Construction Division Technical Session 4: Capstone, Safety and Beyond
8:00 a.m. - 9:30 a.m., Room 257 B, Convention Center - Salt Palace
Sponsor: Construction Engineering Division
Moderators: Gary Gehrig, University of North Carolina, Charlotte;
Donna Hollar, East Carolina University

Utilizing Capstone Courses in Separate Fields to Create Real-World Multidisciplinary Team Simulations
Mr. Bradley Louis Benhart, Purdue University
Mr. Clark A. Cory Ph.D., Purdue University, West Lafayette (College of Engineering)
Ms. Rabita Rajkarnikar, Purdue University
Mr. Cirilo I. Rangel, Purdue University
Mr. Mark Shawerette, Purdue Polytechnic Institute

Interactive Safety Training: A Technological Tool for Fall Protection on Construction Sites
Melissa Lynn Hrivnak, Ohio State University
Ms. Sheena Nastasia Marston, Dynotec Inc
Dr. Rachel Louis Kajfez, Ohio State University
Dr. Lisa E. Burris, Ohio State University
Prof. Fabian Hadipriono Tan Dr.Eng., Ohio State University

Examination of Future Construction Career Role Preferences and Identities of Construction Students
Mr. Dorail F. Porter, Associated General Contractors
Dr. Andrea Nana Ofori-Boadu, North Carolina A&T State University

T110 - CPDD Faculty Breakfast
8:00 a.m. - 9:30 a.m., Salon H, HQ Hotel - Marriott at City Creek
Sponsor: Continuing Professional Development Division

Networking opportunity over breakfast for faculty, staff, and industry representatives interested in addressing the professional development needs of practicing engineers. Free but registration requested.
Free ticketed event

T1100 - INDUSTRY DAY: CMC and CIPD Breakfast
8:00 a.m. - 9:30 a.m., Salon I, HQ Hotel - Marriott at City Creek
Sponsors: Corporate Member Council; College Industry

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Partnerships Division
CMC and CIPD joint breakfast.

T1101 - Council of Section Meetings
8:00 a.m. - 9:30 a.m., Room 250 B, Convention Center - Salt Palace
Sponsor: Council of Sections
Council of section meetings.

T1102 - EDC Breakfast and Business Meeting
Sponsored by University of Florida
8:00 a.m. - 9:30 a.m., Room 150 A - Sponsor Tech Room, Convention Center - Salt Palace
Sponsor: Engineering Deans Council
EDC breakfast and business meeting.
Ticketed event: EDC Breakfast - $35.00 advanced registration and $45.00 on site registration

T1109A - Sponsor Technical Session:
Bring Robotics into Your Curriculum with BeagleBone® Blue—Presented by Texas Instruments
8:00 a.m. - 9:30 a.m., Room 150 A - Sponsor Tech Room, Convention Center - Salt Palace
Sponsor: Sponsored Sessions
BeagleBone Blue is a complete, Linux-enabled robotics computer. This hands-on workshop will get you up and running in 15 mins with BeagleBone Blue’s robotics-oriented peripherals making building mobile robots quick and affordable. Join Professor Mark Yoder and Franklin Cooper to get a first look at this platform rich with capability for mechatronics and robotics to fit your curriculum. Leave with the ability to integrate it into courses, projects, and on-campus innovation labs, complementing yourLaunchPad development kits.
Presenters: Dr. Mark Yoder, Rose-Hulman Institute of Technology; and Franklin Cooper, Texas Instruments
Breakfast will be provided.

T1109B - Sponsor Technical Session:
The Textbook Evolution—Breakfast Faculty Panel Hosted by McGraw-Hill
8:00 a.m. - 9:30 a.m., Room 150 C - Sponsor Tech Room, Convention Center - Salt Palace
Sponsor: Sponsored Sessions
Breakfast Panel Discussion: The Textbook Evolution: delivering a dynamic, active-learning experience for today’s engineering students. Join McGraw-Hill Education for an insightful panel discussion with engineering faculty members who will discuss the evolution of the classroom experience, revealing how they deliver a rich, active-learning experience for engineering students.

Many of today’s students are reluctant to purchase expensive classroom materials and have come to rely on a wide variety of sources. How do you create a diverse and dynamic learning environment that fosters optimal student outcomes? The panelists will share success stories

T1109C - Sponsor Technical Session: Basic System-on-Chip (SoC) Design Education Kit from Arm University Program
8:00 a.m. - 9:30 a.m., Room 150 B - Sponsor Tech Room, Convention Center - Salt Palace
Sponsor: Sponsored Sessions
Speaker: Victor P. Nelson, Department of Electrical and Computer Engineering, Auburn University
Summary:
The revolution in mobile computing has been driven by the low power and integrated performance available in modern System-on-Chip (SoC) designs. As a result, understanding and practicing SoC Design is a crucial part of the curriculum in any electrical and electronic engineering or computer science department. This workshop introduces the basic System-on-Chip (SoC) Design Education Kit from the Arm University Program and the Arm Cortex-M0 DesignStart Evaluation Kit. Using the ultra-low power Arm Cortex-M0 soft core and FPGAs as prototyping platforms, the education kit takes students through a typical process from creating high-level functional specifications to design, implementation, and testing on real inexpensive FPGA hardware.
Central to this education kit is a full set of teaching materials that includes lecture slides, lab manuals with solutions for professors, quizzes with answers, and more, which can be readily used in a typical 10- to 14-week course. The teaching materials cover both fundamentals and practical knowledge. The full education kit includes a complete set of teaching materials comprising lecture notes and hands-on experiments with solutions, a number of seed hardware boards donated by partners, and licenses of the Keil MDK Professional Edition embedded software development tools from Arm—all available free of charge to professors worldwide (subject to a qualification process).
Using the Numato Lab Mimas V2 Spartan 6 FPGA Development Board as the hardware platform, this session will demonstrate the use of the education kit to implement a simple SoC design, and then an SoC for energy-efficient Internet of Things applications incorporating add-on sensor and radio modules. Faculty participants interested in following the speaker on the lab demos should have already downloaded and

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installed the Xilinx WebPACK ISE at: https://www.xilinx.com/products/design-tools/ise-design-suite/ise-webpack.html, as well as downloaded the Arm Cortex-M0 DesignStart Evaluation Kit at https://developer.arm.com/products/designstart/university-program (now readily accessible via a click-through agreement). Furthermore, faculty participants who have already downloaded the Cortex-M0 core will receive a free Numato Lab Mimas V2 board, enabling them to be hands-on during the workshop. This workshop is presented by Arm Ltd., Cambridge UK; and Numato Lab, Electronics City, Bangalore India.

BIOGRAPHY of SPEAKER
Victor P. Nelson is a Professor and Assistant Chair of Electrical and Computer Engineering at Auburn University, where he has been on the faculty since 1978.

T1112 - Action on Diversity - Safe Zone Ally Training (Level 1)
8:00 a.m. - 9:30 a.m., Room 150 E, Convention Center - Salt Palace
Sponsors: ASEE Diversity Committee; Minorities in Engineering Division
Moderator: Rocio Chavela Guerra, American Society for Engineering Education
Speakers: Dr. Rocio C. Chavela Guerra, American Society for Engineering Education; Dr. Stephanie Farrell, Rowan University; Dr. Mahesh Aggarwal, Gannon University; Mr. Tiago R. Forin, Rowan University
Tickets are requested for planning purposes only! Please come even if you do not sign up in advance. Did you know…
- 1 in 5 LGBTQIA+ students fears for their physical safety on college campuses?
- 1 in 3 LGBTQIA+ students is made to feel uncomfortable in our classrooms?
- LGBTQIA+ engineering students are more likely than women, underrepresented minorities, and non-LGBTQ peers to report a chilly climate
- STEM departments are lagging way behind other disciplines in the adoption of LGBTQIA+-inclusive practices.
You can help change this! Safe Zone Ally Training is a series of interactive workshops for students, faculty and the professional community, during which participants will build the knowledge and skills needed to create a more inclusive and affirming environment for LGBTQIA+ individuals in engineering. The workshops have been developed by a community of Science and Engineering professionals and students, specifically for a STEM audience.
Safe Zone Level 1 focuses on understanding LGBTQIA+ concepts and the coming out process, responding to bias, and adopting simple strategies for building an inclusive environment.
Safe Zone Level 2 discusses aspects of engineering culture that act as barriers to LGBTQIA+ equality and explore heterosexual and cisgender privilege. Participants learn to recognize bias and disrupt discrimination. The Deep Dive LGBTQIA+ Inclusion workshop focuses on creating a supportive and inclusive environment for transgender students and colleagues.
Participants in Levels 1 and 2 will receive a Safe Zone sticker to display in their workplace. Digital badges will be awarded for participation in each workshop in the Safe Zone series.
Free ticketed event

T1116 - ABET SESSION: How to Lead the Preparation for an On-Site Visit
8:00 a.m. - 9:30 a.m., Room 150 D, Convention Center - Salt Palace
Sponsor: ABET Sponsored Sessions
Leading the institutional planning and execution for an onsite ABET visit involves creating an infrastructure of support from many groups of stakeholders. This session features a panel representing both the engineering and engineering technology accreditation commissions and institutional representatives who hosted ABET visits during 2016. Best practices from the viewpoints of both program evaluators and institutional representatives will be of interest to institutional representatives and others preparing for on-site visits.

T113A - Student Empathy and Human-Centered Design
8:00 a.m. - 9:30 a.m., Room 155 C, Convention Center - Salt Palace
Sponsor: Design in Engineering Education Division
The Impact of Functional Modeling on Engineering Students’ Mental Models
Jacob Thomas Nelson, Dr. Julie S. Linsey, Georgia Institute of Technology Dr. Robert L. Nagel, James Madison University Dr. John Krupczak Jr., Hope College Prof. Matt Robert Bohm, Florida Polytechnic University
Characterizations and Portrayals of Intuition in Decision-Making: A Systematic Review of Management Literature to Inform Engineering Education
Dr. Emily Dringenberg, Ohio State University Prof. Annie Abell, Ohio State University
Increasing Student Empathy Through Immersive User Empathy Experiences in First-Year Design Education
Lexie Mitchell, Colorado School of Mines Leslie Light, Colorado School of Mines
Implications of Contextual Empathic Design for Engineering Education
Mr. Benedikt von Unold, Stanford University Ms. Annette Isabel Böhmer, Laboratory for Product Development and Lightweight Design Dr. Tua A. Björklund, Aalto University Design Factory Mr. Nicolas Ledl, Stanford University Prof. Udo Lindemann, Laboratory for Product Development and Lightweight Design Dr. George Toye, Stanford University Dr. Shen Sheppard, Stanford University
Human-Centered Design Incorporated in the Freshman Year through an Active Learning Engineering Design Lab: Best Practices, Lessons Learned, and Proposed Improvements
Dr. Kirsten Heikkinen Dodson, Lipscomb University

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T113B - Design in Engineering Education
Division Technical Session 9
8:00 a.m. - 9:30 a.m., Room 255 E, Convention Center - Salt Palace
Sponsor: Design in Engineering Education Division

T113C - Design in Engineering Education
Division Technical Session 8
8:00 a.m. - 9:30 a.m., Room 155 A, Convention Center - Salt Palace
Sponsor: Design in Engineering Education Division

T114A - Cognitive Engagement
8:00 a.m. - 9:30 a.m., Room 355 D, Convention Center - Salt Palace
Sponsor: Educational Research and Methods Division
Moderators: Kris Jaeger-Helton, Northeastern University; Koenraad Gieskes, Binghamton University
Education Research and Methods Division Technical Session
Measuring Engineering Students’ In-class Cognitive Engagement: Survey Development informed by Contemporary Educational Theories
Mr. Benjamin David Lutz, Oregon State University
Ms. Allyson Jo Ironside, Oregon State University
Dr. Nathaniel Hunsu, University of Georgia
Dr. Cassandra J. Groen, Virginia Tech
Dr. Shane A. Brown, Oregon State University
Dr. Olusola Adesope, Washington State University
Dr. Denise Rutledge Simmons, P.E., Virginia Tech
Fostering an Enriching Learning Experience: A Multisite Investigation of the Effects of Desktop Learning Modules on Students’ Learning Experiences in Engineering Classrooms
Dr. Nathaniel Hunsu, University of Georgia
Dr. Olusola Adesope, Washington State University
Prof. Bernard J. Van Wie, Washington State University
Ms. Negar Beheshti Pour, Washington State University
Personal Epistemology: The Impact of Project-based Learning
Miss Rongrong Liu,
Dr. Jiabin Zhu, Shanghai Jiao Tong University
A Multi-Epistemological Mapping of Knowing, Learning, and Analytics in Materials Science and Engineering
Mr. Petr Johanes, Stanford University
Application of Brain-based Learning Principles to Engineering Mechanics Education: Implementation and Preliminary Analysis of Connections Between Employed Strategies and Improved Student Engagement
Dr. Firas Akasheh, Tuskegee University
Dr. John T. Solomon, Tuskegee University
Dr. Eric Hamilton, Pepperdine University
Dr. Chitra R. Nayak, Tuskegee University
Dr. Vimal Kumar Viswanathan, San Jose State University
Student Perspectives on Cognitive Engagement: Preliminary Analysis from the Course Social and Cognitive Engagement Surveys
Ms. Allyson Jo Ironside, Oregon State University
Dr. Shane A. Brown, P.E., Oregon State University
Mr. Benjamin David Lutz, Oregon State University

T114B - Motivation, Identity, and Belongingness
8:00 a.m. - 9:30 a.m., Room 355 C, Convention Center - Salt Palace
Sponsor: Educational Research and Methods Division
Moderators: Vignesh Subbian, University of Arizona; James Huff, Harding University
Educational Research and Methods Division Technical Session
Gender, Motivation, and Pedagogy in the STEM Classroom: A Quantitative Characterization
Prof. Jonathan D. Stolk, Franklin W. Olin College of Engineering
Dr. Yevgeniya V. Zastavker, Franklin W. Olin College of Engineering
Dr. Michael D. Gross, Wake Forest University
The Challenges and Affordances of Engineering Identity as an Analytic Lens
Ms. Christine Allison Gray, Northern Arizona University
Dr. Robin Tuschcherer, P.E., Northern Arizona University
Dr. Ron Gray, Northern Arizona University
Development and Testing of an Instrument to Understand Engineering Doctoral Students’ Identities and Motivations
Heather Lee Perkins, North Carolina State University
Mr. Matthew Bahnson, North Carolina State University
Mrs. Marissa A. Tsugawa-Nieves, University of Nevada, Reno
Blanca Miller, University of Nevada, Reno
Dr. Adam Kirn, University of Nevada, Reno
Dr. Cheryl Cass, North Carolina State University
A Combined Model for Predicting Engineering Identity in Undergraduate Students
Anita D. Patrick, University of Texas, Austin
Dr. Maura Borrego, University of Texas, Austin
Dr. Carolyn Conner Seepersad, University of Texas, Austin
You Either Have It or You Don’t: First Year Engineering Students’
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**Conference Sessions**

**Tuesday, June 26**

**Experiences of Belongingness**

Ms. Jacqueline Ann Rohde, Purdue University  
Dr. Lisa Benson, Clemson University  
Dr. Geoff Potvin, Florida International University  
Dr. Adam Kirn, University of Nevada, Reno  
Dr. Allison Godwin, Purdue University, West Lafayette (College of Engineering)

**Engineering Identity Development of Hispanic Students**

Dr. Meagan R. Kendall, University of Texas, El Paso  
Mr. Nathan Hyungsok Choe, University of Texas, Austin  
Ms. Maya Denton, University of Texas, Austin  
Dr. Maura Borrego, University of Texas, Austin

**T115A - ECE Division Business Meeting**

7:00 a.m. - 7:55 a.m., Room 251 A, Convention Center - Salt Palace  
Sponsor: Electrical and Computer Division  
The ECE Division business meeting allows division officers, members, and guests to review the division’s yearly activities and plan activities for the next year. The annual Division Officer elections will be conducted.

**T115B - Electrical and Computer Division Technical Session 4**

8:00 a.m. - 9:30 a.m., Room 150 F, Convention Center - Salt Palace  
Sponsor: Electrical and Computer Division  
Moderator: Muhammad Khan, Arkansas Tech University  

Dr. Zahrasadat Alavi, California State University, Chico  
Dr. Arash Kialashaki, California State University, Chico  

A Study on Measuring Self-efficacy in Engineering Modeling and Design Courses  
Dr. Muhammad Safeer Khan, Arkansas Tech University  
Dr. Nansong Wu, Arkansas Tech University  
Dr. Mohamed Ibrahim, Arkansas Tech University  

Designing a Curriculum that Helps Students Create Connected Narratives in Electrical Engineering  
Sara Kaye Jones, Iowa State University  
Dr. Mani Mina, Iowa State University  

Documenting Engineering Identity: Electrical and Computer Engineering Departmental Documents and Student Identity  
Dr. Rachel E. Friedensen, Iowa State University  
Dr. Erin E. Doran, Iowa State University  
Dr. Sarah Rodriguez, Iowa State University  

How Free Choice Affects Student Interest in a Junior-level Embedded Systems Lab Course  
Mr. Michael Trent Bolt, Auburn University  
Mr. Andrew Cookston, Auburn University  
Prof. John Y. Hung, Auburn University  
Dr. Victor P. Nelson, Auburn University  
Prof. Mark Lee Adams, Auburn University

**T115C - IEEE Education Society Strategic Planning Committee**

8:00 a.m. - 9:30 a.m., Room 251 C, Convention Center - Salt Palace  
Sponsor: Electrical and Computer Division  

**T116 - Energy Conversion and Conservation Division Technical Session on Energy Efficiency and Power Grid Security**

8:00 a.m. - 9:30 a.m., Room 253 B, Convention Center - Salt Palace  
Sponsor: Energy Conversion and Conservation Division  
Moderators: Siamak Farhad, University of Akron; Herbert Hess, University of Idaho, Moscow  

Study of Energy Efficiency Characteristics of a Hydraulic System Component  
Dr. Alamgir A. Choudhury, Western Michigan University  
Prajna Paramita, Western Michigan University  
Dr. Jorge Rodriguez PE, Western Michigan University  
Air Entrapment Issues in Piping for a Small Hydroelectric Station in Western North Carolina  
Dr. George D. Ford, Western Carolina University  
Dr. Hayrettin B. Karayaka, Western Carolina University  
Dr. Sung Joon Suk, Western Carolina University  
Testbed for Transactive Energy and its Effects on the Distribution System and Protective Devices Settings  
Dr. Ilya Y. Grinberg, Buffalo State  
A Hardware-in-the-loop Experimental Platform for Power Grid Security  
Mr. James Dylan Kollmer, Dr. Saroj K Biswas, Temple University  
Dr. Li Bai, Temple University  
Dr. Arif I. Sarwat, Florida International University  
Walid Saad, Virginia Tech  
Enhanced Workforce Development via the 2017 FEEDER Student Summer Program  
Dr. Robert J. Kerestes, University of Pittsburgh  
Dr. Zhihua Qu, University of Central Florida  
Dr. Damla Turgut, University of Central Florida

**T117 - Engineering and Public Policy Business Meeting**

7:00 a.m. - 7:55 a.m., Room 251 B, Convention Center - Salt Palace  
Sponsor: Engineering and Public Policy Division  
Ticketed event: $25.00 advanced registration and $35.00 on site registration

**T118 - EDGD: Potpourri**

8:00 a.m. - 9:30 a.m., Room 151 B, Convention Center - Salt Palace  
Sponsor: Engineering Design Graphics Division  
Moderators: Rustin Webster, Purdue University, New Albany; Raghu Pucha, Georgia Institute of Technology
Detection and Incidence of Plagiarism in a Solid Modeling Course
Dr. Steven Joseph Kirstukas, Central Connecticut State University
Using Online Tutorials in an Introductory Engineering Graphics Course to Improve Outcomes
Dr. Nancy E. Study, Pennsylvania State University, Erie
Mr. Michael Lobaugh, Pennsylvania State University, Erie
The Engineering Design Graphics Journal and Its Selected Metrics of Effect
Dr. Robert A. Chin, East Carolina University

T120 - Engineering Ethics Division Technical Session 3
8:00 a.m. - 9:30 a.m., Room 155 F, Convention Center - Salt Palace
Sponsor: Engineering Ethics Division
Moderators: Brent Jesiek, Purdue University-Main Campus, West Lafayette (College of Engineering); Diana Bairaktarova, Virginia Tech
A Longitudinal Study of Social and Ethical Responsibility Among Undergraduate Engineering Students: Comparing Baseline and Midpoint Survey Results
Ms. Shiloh M. James Howland, Brigham Young University Dr. Gregg Morris Warnick, Brigham Young University Dr. Carla B. Zoltowski, Purdue University, West Lafayette Prof. Brent K. Jesiek, Purdue University, West Lafayette Dr. Randall Davies, Brigham Young University
Student Learning About Engineering and Corporate Social Responsibility: A Comparison Across Engineering and Liberal Arts Courses
Dr. Jessica Mary Smith, Colorado School of Mines Dr. Nicole M. Smith, Colorado School of Mines Dr. Greg Rulifson P.E., Colorado School of Mines Dr. Carrie J. McClelland P.E., Colorado School of Mines Dr. Linda A. Battalora, Colorado School of Mines Dr. Emily A. Sarver, Virginia Tech Rennie B. Kaunda, Colorado School of Mines
Understanding Ethical Reasoning in Design Through the Lens of Reflexive Principlism
Danielle Corple, Purdue University, West Lafayette Mr. David H. Torres, Purdue University, West Lafayette Dr. Carla B. Zoltowski, Purdue University, West Lafayette Katharine E. Miller, Dr. Megan Kenny Feister, California State University, Channel Islands Prof. Patrice Marie Buzzanell, University of South Florida
The Value of Ethics in Engineering: Hypotheses and Preliminary Data
Dr. Jonathan Beever, University of Central Florida
Exploring the Relationship Between Ethical Awareness and Personality Traits of Undergraduate Engineering Students
Mr. Samuel Aaron Snyder, Virginia Tech
Indhira María Hasbún, Virginia Tech
Ms. Jessica Deters, Virginia Tech

T121 - ELD Business Meeting
8:00 a.m. - 9:30 a.m., Salon D, HQ Hotel - Marriott at City Creek
Sponsor: Engineering Libraries Division
The annual business meeting of the Engineering Libraries Division. Free ticketed event

T122 - CEMAL Business Meeting
7:00 a.m. - 7:55 a.m., Room 250 B, Convention Center - Salt Palace
Sponsor: Engineering Management Division

T123 - JET Board Meeting
8:00 a.m. - 9:30 a.m., Room 251 A, Convention Center - Salt Palace
Sponsor: Engineering Technology Division
Annual business meeting

T123B - ET Administrative Issues
8:00 a.m. - 9:30 a.m., Room 253 A, Convention Center - Salt Palace
Sponsor: Engineering Technology Division
Moderators: Otilia Popescu, Old Dominion University; Xiaobin Lei, Wentworth Institute of Technology
Engineering Technology and Engineering Program Comparison of Underrepresented Students in the Same Institution
Dr. Anne M. Lucietto, Purdue Polytechnic Institute Dr. Lesley M. Berhan, University of Toledo
Creating a New Engineering Technology Program Using the UdD Approach
Dr. Nancy K. Sundheim, St. Cloud State University
Gathering ABET Student Outcome Evidence Using Technology: What Happens When Results Don’t Match Grant Goals and Research Takes an Unexpected Turn?
Elizabeth Freije, Indiana University-Purdue University of Indianapolis Prof. Barbara Christe, Indiana University-Purdue University of Indianapolis Prof. Elaine M. Cooney, Indiana University-Purdue University of Indianapolis
IoT-based Building Automation and Energy Management
Dr. Joseph A. Morgan, Texas A&M University Dr. Jay R. Porter, Texas A&M University Dr. Michael Johnson, Texas A&M University
Using Lean Principles to Improve an Engineering Technology Assessment Process
Prof. Kevin R. Cook, Montana State University Prof. Robb E. Larson, Montana State University Dr. Daniel Miller

T124 - Entrepreneurship & Engineering Innovation Division Technical Session 4
8:00 a.m. - 9:30 a.m., Room 260 A, Convention Center - Salt Palace
Sponsor: Entrepreneurship & Engineering Innovation Division

Dr. Diana Bairaktarova, Virginia Tech
Monday, June 25

Conference Sessions

Moderators: Pritpal Singh, Villanova University; Maria-Isabel Carnasciali, University of New Haven

Exploring the Dynamic Interactions and Cognitive Characteristics of NSF Innovation Corps (I-Corps) Teams
Dr. Kathryn Weed Jablokow, Pennsylvania State University
Dr. Neeraj Sonalkar, Stanford University
Mr. Brian D. Thompson, University of Wisconsin, Milwaukee
Mohamed M. Megahed, Pennsylvania State University
Pratik Subhash Pachpute, Pennsylvania State University
Exploring the Dynamic Interactions and Cognitive Characteristics of NSF Innovation Corps (I-Corps) Teams
Dr. Kathryn Weed Jablokow, Pennsylvania State University
Dr. Neeraj Sonalkar, Stanford University
Mr. Brian D. Thompson, University of Wisconsin, Milwaukee
Mohamed M. Megahed, Pennsylvania State University
Pratik Subhash Pachpute, Pennsylvania State University

T126 - Division for Experimentation & Laboratory-Oriented Studies Technical Session 3
8:00 a.m. - 9:30 a.m., Room 254 C, Convention Center - Salt Palace
Sponsor: Experimentation and Laboratory-Oriented Studies Division
Moderator: Bridget Smyser, Northeastern University

Laboratory and experiment design.
Field Investigations: An Overlooked Form of Laboratory Experience
Prof. David F. Radcliffe, Swinburne University of Technology
Dr. Mary K. Pilotte, Purdue University, West Lafayette
Is a Virtual Reality-based Laboratory Experience a Viable Alternative to the Real Thing?
James R. McCusker Ph.D., Wentworth Institute of Technology
Mr. Mohammed A. Almaghribi, Wentworth Institute of Technology

Tuesday, June 26

Conference Sessions

Moderators: Pritpal Singh, Villanova University; Maria-Isabel Carnasciali, University of New Haven

Exploring the Dynamic Interactions and Cognitive Characteristics of NSF Innovation Corps (I-Corps) Teams
Dr. Kathryn Weed Jablokow, Pennsylvania State University
Dr. Neeraj Sonalkar, Stanford University
Mr. Brian D. Thompson, University of Wisconsin, Milwaukee
Mohamed M. Megahed, Pennsylvania State University
Pratik Subhash Pachpute, Pennsylvania State University

Engineering Deans’ Perspectives on the Value of Entrepreneurial Thinking in Engineering Education
Mr. Mark V. Huerta, Arizona State University
Dr. Jeremi S. London, Arizona State University, Polytechnic Campus
Dr. Ann F. McKenna, Arizona State University, Polytechnic Campus

‘It was a Failure, But a Good Failure’: A Qualitative Study Exploring Engineering Students’ Critical Entrepreneurship Experiences and Their Impacts
Mr. Mark V. Huerta, Arizona State University

Early-career Engineers at the Workplace: Meaningful Highs, Lows, and Innovative Work Efforts
Mr. Mathias J. Klenk, Technical University of Munich
Dr. Tua A. Björklund, Aalto University Design Factory
Dr. Shannon Katherine Gilmartin, SKG Analysis
Dr. Sheri Sheppard, Stanford University

Food for Thought: Predicting Entrepreneurial Behavior
Dr. Craig G. Downing, Rose-Hulman Institute of Technology
Dr. Thomas P. James P.E., Rose-Hulman Institute of Technology
Dr. Diane Evans, Rose-Hulman Institute of Technology

T127A - First-year Programs Division: Collection
8:00 a.m. - 9:30 a.m., Salon J, HQ Hotel - Marriott at City Creek
Sponsor: First-Year Programs Division
Moderators: Elizabeth Stephan, Clemson University; Natalie Van Tyne, Virginia Tech

Full paper presentations related to a variety of first-year engineering topics.

First Generation Engineering Student Mentoring Program: A Case Study of a Large Engineering School in the U.S.
Dr. Bimal P. Nepal, Texas A&M University
Dr. Michael Johnson, Texas A&M University
Dr. Timothy J. Jacobs, Texas A&M University
Dr. Mark Weichold, Texas A&M University

First-year Engineering Student Expectations and Experiences:
Community, College, and Curriculum
Dr. Susan F. Freeman, Northeastern University
Mr. Christopher Peter Sciana, Northeastern University

Social Network Analysis of Faculty Connections in a Multi-year Professional Development Program
Prof. James A. Middleton, Arizona State University
Dr. Eugene Judson, Arizona State University
Prof. Stephen J. Krause, Arizona State University
Prof. Robert J. Culbertson, Arizona State University
Mrs. Lindy Hamilton Mayled, Arizona State University
Lydia Ross, Arizona State University
Kara L. Hjelmstad, Arizona State University
Dr. Ying-Chih Chen, Arizona State University

How Competitive are Freshman Engineering Students in Constructively Rating Their Peers in a Team Context?
Dr. Benjamin Emery Mertz, Arizona State University
Dr. Daniel M. Ferguson, Purdue University, West Lafayette
Mohd Iramul Hoque, CATME

A Second Year Review of a New FYE Program
Dr. George D. Ricco, University of Kentucky
Dr. Janet K. Lumpp, University of Kentucky
Mr. Joshua Parsons,
Dr. Shannon Lee Sampson,
Brad A. Hubbard, University of Kentucky

Schedule subject to change: Please go to www.asee.org/icp for up to date information
**T127B - First-year Programs Division: Self Efficacy**
8:00 a.m. - 9:30 a.m., Room 257 A, Convention Center - Salt Palace
**Sponsor:** First-Year Programs Division
**Moderators:** Ken Gentry, Northwestern University; Michael Elmore, Binghamton University

Five full papers presented on topics related to self-concept and efficacy. Exploring Engineering Major Choice and Self-concept Through First-year Surveys
- Ms. Stacey Leigh Kelly, Virginia Tech
- Darren K. Maczka, Virginia Tech
- Dr. Jacob R. Grohs, Virginia Tech
- Dr. Diana Bairaktarova, Virginia Tech

Confidently Uncomfortable: First-year Student Ambiguity Tolerance and Self-efficacy on Open-ended Design Problems
- Dr. Joshua L. Hertz, Northeastern University

Sketching with Students: An Arts-informed Qualitative Analysis of First-year Engineering Students
- Desen Sevi Ozkan, Virginia Tech
- Dr. Cherie D. Edwards, Virginia Tech
- Dr. Sreyoshi Bhaduri, Virginia Tech
- Dr. Diana Bairaktarova, Virginia Tech

Gallup StrengthsFinder in Engineering
- Dr. Brenda Read-Daily, Elizabethtown College
- Dr. Kurt M. DeGoede, Elizabethtown College
- Stacey L. Zimmerman, Elizabethtown College

Reported Changes in Students’ Perceptions of Their Abilities to Succeed on the ABET Student Outcomes During the First-year Engineering Program
- Dr. Tanya Dugat Wicklliff, Texas A&M University
- Dr. So Yoon Yoon, Texas A&M University
- Dr. Jacques C. Richard, Texas A&M University
- Dr. Noemi V. Mendoza Diaz, Texas A&M University

**T128 - Graduate Studies Potpourri**
8:00 a.m. - 9:30 a.m., Room 151 D, Convention Center - Salt Palace
**Sponsor:** Graduate Studies Division
**Moderator:** Sarah Zappe, Pennsylvania State University, University Park

Papers on a variety of topics related to graduate studies in engineering disciplines.

**Capstone Internships for Engineering Management Professional**
- Prof. Lisa Miller, University of Minnesota, Twin Cities
- Dr. Daniel Emery,

**Diverse Teams Build Better Forecasts**
- Dr. Joseph Wilck, College of William and Mary
- Dr. Paul C. Lynch, Penn State Erie

**Introducing Changemaking Engineering into an Operations Research Course: Some Unexpected Results**
- Dr. Rick Olson, University of San Diego
- Mr. Andrés Esteban Acero, Universidad de los Andes

**Writing as a Method to Build Better Engineers: Examining Faculty Perceptions of Writing’s Importance**
- Elizabeth Kovalchuk, Montana State University
- Dr. William J. Schell IV P.E., Montana State University

**T129 - IED Technical Session: Preparing Students for the Future**
8:00 a.m. - 9:30 a.m., Room 255 F, Convention Center - Salt Palace
**Sponsor:** Industrial Engineering Division
**Moderator:** Paul Lynch, Penn State Erie, The Behrend College

A Framework for Collaborative Peer Review for Group-written Documents
- Prof. Lisa Miller, University of Minnesota, Twin Cities
- Dr. Daniel Emery, Diverse Teams Build Better Forecasts
- Dr. Joseph Wilck, College of William and Mary
- Dr. Paul C. Lynch, Penn State Erie

Introducing Changemaking Engineering into an Operations Research Course: Some Unexpected Results
- Dr. Rick Olson, University of San Diego
- Mr. Andrés Esteban Acero, Universidad de los Andes

Writing as a Method to Build Better Engineers: Examining Faculty Perceptions of Writing’s Importance
- Elizabeth Kovalchuk, Montana State University
- Dr. William J. Schell IV P.E., Montana State University

**T132 - Study and Research Abroad**
8:00 a.m. - 9:30 a.m., Room 355 A, Convention Center - Salt Palace
**Sponsor:** International Division
**Moderator:** Eugene Rutz, University of Cincinnati

A Study Abroad Course Leads to Service Learning Project
- Dr. Charles McIntyre, Indiana University-Purdue University of Indianapolis
- Mr. Ryan A. Camp, Indiana University-Purdue University of Indianapolis
- Prof. Patricia Fox, Indiana University-Purdue University of Indianapolis
- Shawn Patrick, Short-term, Full-semester, Study-abroad Engineering Programming and Signals & Systems Courses
- Dr. Ernest M. Kim, University of San Diego
- Dr. Thomas F. Schubert Jr. P.E., University of San Diego
- Dr. Shaghayegh Abbasi, University of San Diego

Student Learning in International Research Programs: A Comparison Across Cultural Contexts
- Ms. Kirsten Davis, Virginia Tech
- Yousef Jalali, Virginia Tech
Tuesday, June 26

### T133A - Elementary Students: Computational Thinking, Reasoning, and Troubleshooting
8:00 a.m. - 9:30 a.m., Room 258, Convention Center - Salt Palace
**Sponsor:** Pre-College Engineering Education Division  
**Moderator:** Cheryl Carrico, Virginia Tech

This session dives into fundamental work on elementary engineering education.

**Examining Children’s Engineering Practices During an Engineering Activity in a Designed Learning Setting: A Focus on Troubleshooting (Fundamental)**  
Ms. Hoda Ehsan, Purdue University, West Lafayette  
Mrs. Jessica Rush Leeker, Purdue University, West Lafayette  
Dr. Monica E. Cardella, Purdue University, West Lafayette  
Dr. Gina Navoa Svarovsky, University of Notre Dame

**Initial Problem Scoping in K-2 Classrooms (Fundamental)**  
Emily M. Haluschak,  
Ms. Michelle L. Stevens, Lafayette School Corporation  
Dr. Tamara J. Moore, Purdue University, West Lafayette  
Kristina Manyama Tank, Iowa State University  
Dr. Monica E. Cardella, Purdue University, West Lafayette  
Dr. Morgan M. Hynes, Purdue University, West Lafayette  
Mrs. Elizabeth Gajdzik, Purdue University, West Lafayette  
Mr. Ruben D. Lopez-Parra Lopez, Purdue University, West Lafayette

**STEM Content in Elementary School Students’ Evidence-based Reasoning Discussions (Fundamental)**  
Emilie A. Silverling, Purdue University, West Lafayette  
Elizabeth Suazo-Flores,  
Prof. Tamara J. Moore, Purdue University, West Lafayette

### T133B - Program Evaluation Studies
8:00 a.m. - 9:30 a.m., Room 151 C, Convention Center - Salt Palace
**Sponsor:** Pre-College Engineering Education Division  
**Moderator:** Roxanne Moore, Georgia Institute of Technology

Engineering outreach and out-of-school evaluation studies are featured in this session.

**An Investigation of Students’ Experiences in a K-12 Invention Program (Evaluation)**  
Dr. Sunni Haag Newton, Georgia Institute of Technology  
Dr. Meltem Alemdar, Georgia Institute of Technology  
Dr. Roxanne A. Moore, Georgia Institute of Technology  
Christopher J. Cappelli, Georgia Institute of Technology

**An Evaluation on Engineering Identity of K-12 Youth Using the Engineering Ambassador Network (Evaluation)**  
Ms. Sally T. Wei, University of Nebraska, Lincoln  
Dr. Trish Wonch Hill, University of Nebraska, Lincoln

### T133C - Middle School Engineering Education
8:00 a.m. - 9:30 a.m., Room 151 G, Convention Center - Salt Palace
**Sponsor:** Pre-College Engineering Education Division  
**Moderator:** John Carpinelli, New Jersey Institute of Technology

Session topics include scaffolding, problem scoping, and engineering language.

**A Teacher’s Use of Engineering Language in an Engineering Design-based STEM Integration Unit (Fundamental)**  
Emilie A. Silverling, Purdue University, West Lafayette  
Prof. Tamara J. Moore, Purdue University, West Lafayette  
Siddika Selcen Guzey, Purdue University, West Lafayette

**Effect of Scaffolding in the Assessment of Engineering Practices for Middle School Students (Fundamental)**  
Debra Brockway, Educational Testing Service  
Mr. Kofi James,  
Teacher Engineering Talk About Problem Scoping in a Middle School Engineering Design-based STEM Integration Unit (Fundamental)**  
Amanda C. Johnston, Purdue University, West Lafayette  
Mr. Murat Akarsu, Purdue University, West Lafayette  
Prof. Tamara J. Moore, Purdue University, West Lafayette  
Siddika Selcen Guzey, Purdue University, West Lafayette

**Argument-driven Engineering in Middle School Science Classrooms: The Study of Engineering Attitudes and Efforts to Broaden Engineering Participation by Exposing All Students to Multiple Engineering Design Tasks (RTP, Diversity)**  
Mr. Lawrence Chua, University of Texas at Austin  
Dr. Victor Sampson, University of Texas at Austin  
Dr. Todd L. Hutner, University of Texas at Austin  
Dr. Stephanie Rivale, University of Texas at Austin  
Dr. Richard H. Crawford, University of Texas at Austin  
Ms. Christina L. Baze Baze, University of Texas at Austin  
Hannah Smith Brooks, University of Texas at Austin

### T135 - Experiences in Manufacturing Engineering Education
8:00 a.m. - 9:30 a.m., Room 260 B, Convention Center - Salt Palace
**Sponsor:** Manufacturing Division  
**Moderators:** Richard Chiou, Drexel University (Eng. & Eng. Tech.); Dawn Wendell, Massachusetts Institute of Technology

Experiences in Manufacturing Engineering Education

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Schedule subject to change: Please go to [www.asee.org/icp](http://www.asee.org/icp) for up to date information.
A P-20 Learning Assessment for Manufacturing Organizations  
Mr. Sidney E Martin III, Murray State University  
Dr. Randal Wilson PhD, Murray State University  

Advanced Manufacturing Engineering Technology Program: a Program that Prepares Graduates for Today’s Manufacturing Industry  
Dr. Hossein Rahemi, Vaughn College of Aeronautics & Technology  
Prof. Amir Elzawawy, Vaughn College of Aeronautics & Technology  
Dr. Yougashwar Budhoo, Vaughn College of Aeronautics and Technology  

Engaging Undergraduate Students Using Real-life Ergonomic Problems in the Introductory Ergonomics Course  
Dr. Muhammad Pervej Jahan, Miami University  

Teaching Undergraduate Manufacturing in a Flipped Classroom  
Dr. Dawn Wendell, Massachusetts Institute of Technology  

Work In Progress: A PLC Trainer With Hands-on Wiring  
Dr. Hugh Jack P.E., Western Carolina University  
Dr. Paul M Yanik, Western Carolina University  
Mr. Jerry N. Denton Denton, Western Carolina University  

Transitioning a Manufacturing Systems Engineering Course to Student-Centered Learning  
Dr. Jason M. Weaver, Brigham Young University  

T136 - Materials Division Technical Session 1  
8:00 a.m. - 9:30 a.m., Room 259, Convention Center - Salt Palace  
Sponsor: Materials Division  
Moderators: Cindy Waters, North Carolina A&T State University; Susan Gentry, University of California, Davis  
This Technical Session will start with a special lecture by the winner of the 2018 New Materials Educator Award, Dr. Alison Polasik. This talk will be held from 8:00 to 8:30 am.  

Encouraging a Growth Mindset in Engineering Students  
Dr. Megan Frary, Boise State University  

Exploration and Innovation in Creative Material Education  
Dr. Robert A Heard, Carnegie Mellon University  
Mr. Christiaan Job Nieman, Universidad de los Andes  

Computational Curriculum for MatSE Undergraduates and the Influence on Senior Classes  
Xiao Zhang, University of Illinois, Urbana-Champaign  
Prof. Andre Schleife, University of Illinois at Urbana-Champaign  
Prof. Andrew Ferguson, University of Illinois, Urbana-Champaign  
Dr. Pascal Bellon, University of Illinois, Urbana-Champaign  
Prof. Timothy Bretl, University of Illinois at Urbana-Champaign  
Dr. Geoffrey L Herman, University of Illinois, Urbana-Champaign  
Prof. Jessica A. Krogstad, Department of Materials Science and Engineering, University of Illinois at Urbana-Champaign  

Dr. Scott R. Hamilton P.E., York College of Pennsylvania
Tuesday, June 26

Conference Sessions

Dr. Joshua Richard Wyrick, York College of Pennsylvania
Exploring the Relationships Between Resilience and Student Performance in an Engineering Statics Class: A Work in Progress
Dr. Peter H. Carnell P.E., University of Georgia
Dr. Nathaniel J Hunsu, University of Georgia
Davis F Ray, The University of Georgia
Dr. Nicola W. Sochacka, University of Georgia
Implementation of an Innovation and Entrepreneur Mindset Concept into Mechanics of Materials Course
Dr. Javad Baqersad P.E., Kettering University
Prof. Yaomin Dong, Kettering University
Prof. Arnaldo Mazzei, Kettering University
Dr. Azadeh Sheidai, Iowa State University
Dr. Basem Alzahabi, Alghurair University
Students – Ask Them to Eat Their Vegetables!
Dr. Julian Ly Davis, University of Southern Indiana
Dr. Tom McDonald, University of Southern Indiana
Teaching Mechanics in Another Country – Reflections on a Professorenaustausch
Dr. Brian P. Self, California Polytechnic State University, San Luis Obispo
Prof. Peter Michael Becker,

T139B - Mechanics Division Business Meeting
7:00 a.m. - 7:55 a.m., Room 250 C, Convention Center - Salt Palace
Sponsor: Mechanics Division
Mechanics Division Business Meeting

T140 - Minorities in Engineering Division Technical Session 4
8:00 a.m. - 9:30 a.m., Room 155 E, Convention Center - Salt Palace
Sponsor: Minorities in Engineering Division
Moderators: Christopher Carr, National Society of Black Engineers; Sheena Reeves, Prairie View A&M University
Identity and Experiences
I Lead, Therefore I Am: The Impact of Student-mentor Leadership Opportunities on STEM Identity Development and Sustainability
Dr. Monique S. Ross, Florida International University
Dr. Trina L. Fletcher, University of Arkansas at Pine Bluff
Dr. Vishodana Thamotharan, Florida International University
Ms. Atalie Garcia,
An Assessment of HBCU STEM Student Experiences: Towards the Development of a Student Persistence Model
Mrs. Shabnam Etemadi Brady, Tennessee State University
Miss Germysa Emily Little, Tennessee State University
Dr. Walter C. Lee, Virginia Tech
Dr. Lesia L. Crompton-Young, Tennessee State University
Dr. Seyoshi Bhaduri, Virginia Tech
Re-framing and Reimagining the Doctoral Student Narrative: Black Women's Experiences in Engineering and Computer Science
Dr. Sharmia Artis, University of California, Irvine
Dr. Marjorie C. Shavers, Heidelberg University

Dr. Stacie LeSure, American Society for Engineering Education
Miss Breauna Marie Spencer, University of California, Irvine
Ms. Aishwarya P Joshi, Heidelberg University
Effects of Research and Internship Experiences on Engineering Task Self-Efficacy on Engineering Students Through an Intersectional Lens
Abisola Coretta Kusimo, Stanford University - Mechanical Engineering Dept.
Marissa Elena Thompson, Stanford University
Dr. Sara A. Atwood, Elizabethtown College
Dr. Sheri Sheppard, Stanford University
Institutional Barriers to Black and Latino Male Collegians’ Success in Engineering and Related STEM Fields
Dr. Leroy L. Long III, Embry-Riddle Aeronautical Univ., Daytona Beach
Trevion S Henderson, University of Michigan
Dr. Michael Steven Williams, University of Missouri

T141 - Multidisciplinary Engineering Division Business Meeting
7:00 a.m. - 7:55 a.m., Room 250 D, Convention Center - Salt Palace
Sponsor: Multidisciplinary Engineering Division
Get involved the MULTI division. The business meeting is open to all interested ASEE members.

T145 - Engineering Physics and Physics Division Technical Session 2
8:00 a.m. - 9:30 a.m., Room 255 D, Convention Center - Salt Palace
Sponsor: Engineering Physics and Physics Division
Moderators: James O'Brien, Wentworth Institute of Technology; Teresa Larkin, American University

Innovative Energy Elevator: a Physics and Engineering Wonder!
Prof. Bala Maheswaran, Northeastern University
Mr. Cristian Scott Stransky, Northeastern University
Dr. Haridas Kumarakur, Northeastern University
Pilot Study on Experience of Engineering Students in Multimedia-enhanced Introductory Physics Labs
Dr. Kosta Popovic, Rose-Hulman Institute of Technology
Janie Szabo, Rose-Hulman Institute of Technology
Problem Design in Homework
Prof. Yumin Zhang, Southeast Missouri State University
Dr. David K. Probst P.E., Southeast Missouri State University
Undergraduate Research and Curricular Redesign of IPLS Laboratory Courses
Mr. Nathaniel Raymond Nunez, Department of Chemistry and Biochemistry, University of Detroit Mercy, Detroit, MI 48221.
Dr. E. Prasad Venugopal, University of Detroit Mercy

T149 - Technological and Engineering Literacy/
Conference Sessions  

Tuesday, June 26

Philosophy of Engineering Division Technical Session 3  
8:00 a.m. - 9:30 a.m., Room 155 D, Convention Center - Salt Palace  
Sponsor: Technological and Engineering Literacy/Philosophy of Engineering Division  

Technological Literacy, Engineering Literacy, Engineers, Public Officials and the Public  
Dr. John Heywood, Trinity College Dublin  
Mr. Michael Patrick Lyons, Michael P. Lyons & Associates  

Engineering and Technology Literacy Introduced in Cornerstone Design Courses  
Prof. Richard Wayne Freeman PE, U.S. Coast Guard Academy  
Dr. J. Alex Birdwell, Northwestern University  
Ms. Janice Mejia, Northwestern University  
Dr. Emma Tevaarwerk, Northwestern University  
Dr. Ken Gentry, Northwestern University  
Dr. Ordel Brown, Northwestern University  

Development of Virtual Environment to Introduce Spatial Reasoning to First- and Second-year Engineering Students  
Dr. Ulan Daleev, Texas A&M University, Kingsville  
Dr. Reg Recayi Pecem, Sam Houston State University  
Dr. Furud Yildiz, Sam Houston State University  
Dr. Shah Alam P.E., Texas A&M University, Kingsville  

Work in Progress: Projects in Engineering Education – Cross-fertilization Between Communication and Situated Learning  
Dr. Joakim Sigurd Wren, Linköping University, Sweden  
Dr. Eva Törnqvist,  

Technical Communication for Engineers: Improving Professional and Technical Skills  
Dr. Alyson Grace Eggleston, The Citadel — The Military College of South Carolina  
Dr. Robert J. Rabb P.E., The Citadel  

T150 - Two-year College Potpourri  
8:00 a.m. - 9:30 a.m., Room 254 B, Convention Center - Salt Palace  
Sponsor: Two-Year College Division  
Moderator: Yiheng Wang, Lone Star College -- CyFair  

A look at various topics, issues and new programs at two-year colleges  
Advancing the Engineering Field: Opportunities to Support  
Transfer Students  
Dr. Vukica M. Jovanovic, Old Dominion University  
Dr. Narketta Sparkman-Key, Old Dominion University  
Dr. Konstantin P. Cigularov, Old Dominion University  
Mrs. Daniela Cigularova,  
Ms. Bonita G. Anthony, Old Dominion University  
Dr. Otilia Popescu, Old Dominion University  

Development of a Cohort-Based Program to Strengthen Retention and Engagement of Underrepresented Community College  
Engineering and Computer Science Students  
Prof. Nicholas Langhoff, Skyline College  
Ms. Jenny Ngoc Le, Skyline College  

Mentoring is a Full Contact Activity in Engineering Education  

T156 - Military and Veterans Division Technical Session 3: Veterans in the Lab Environment  
8:00 a.m. - 9:30 a.m., Room 151 F, Convention Center - Salt Palace  
Sponsor: Military and Veterans Division  
Moderator: Douglas Schutz, Citizens Bank  

This session contains papers discussing topics related to veteran performance in lab and industry environments.  
Creating the Fleet Maker: Lessons Learned from the First Series of Workshops on Maker Concepts for Active Duty Personnel  
Dr. Karina Arcaute, Old Dominion University  
Prof. Michel Albert Audette, Old Dominion University  
Dr. Vukica M. Jovanovic, Old Dominion University  
Dr. Anthony W. Dean, Old Dominion University  
Prof. Dipankar Ghosh, Old Dominion University  

Using Veterans’ Technical Skills in an Engineering Laboratory  
Dr. Noah Salzman, Boise State University  
Dr. Thad B. Welch, Boise State University  
Prof. Harish Subbaraman, Boise State University  
Dr. Cameron H. G. Wright P.E., University of Wyoming  

Integrating Army Doctrine and Engineering Design: Preparing Millennials to Become Future Officers  
Lt. Col. Landon M. Raby, United States Military Academy  
Mr. Erick Martinez, United States Military Academy  
Col. Jeffrey A. Starke, United States Military Academy  
Major Richard Francis Rogers III, United States Army  
Dr. Patrick Baker, United States Military Academy  

Commercial Cyber Certifications for Military Reserve Components  
Dr. John A. Hamilton Jr., Mississippi State University  
Mr. DeMarcus Montrez Thomas, Distributed Analytics and Security Institute  
Dr. Patrick Pape, Distributed Analytics and Security Institute  

T180 - Faculty Development Medley  
8:00 a.m. - 9:30 a.m., Room 151 E, Convention Center - Salt Palace  
Sponsor: Faculty Development Constituency Committee  
Moderator: Stephanie Pulford, University of California, Davis  

Join us for presentations about various aspects of faculty development.
T192 - Academy of Fellows Breakfast
8:00 a.m. - 9:30 a.m., Salon E, HQ Hotel - Marriott at City Creek
Sponsor: Academy of Fellows
Join your friends and colleagues at the annual Fellows Breakfast. Ticketed event: Academy of Fellows - $45.00 advanced registration and $55.00 on site registration

T196F - JEE Pop-Up Workshops
12:00 p.m. - 12:20 p.m., South Foyer, Convention Center - Salt Palace
Sponsor: ASEE Headquarters
The editorial board of the Journal of Engineering Education (JEE) is offering a series of short pop-up workshops to work directly with current and potential authors and reviewers. The workshops will focus on two themes: “How to Be a Star Reviewer” and “How to Get Your Manuscript Through the Review Process Faster.” To find out when the pop-up workshops will be offered, check the conference app for announcements, which will come out one day ahead of time. Information on the dates and times of these workshops will also be available at the ASEE booth in the exhibit hall. Ticketed event

T196G - ASEE Projects Board Meeting
8:30 a.m. - 9:30 a.m., Room 250 D, Convention Center - Salt Palace
Sponsor: ASEE Headquarters

T293 - ASEE TUESDAY PLENARY
9:45 a.m. - 11:15 a.m., Grand Ballroom A-H, Convention Center - Salt Palace
Sponsors: ASEE Board of Directors; Corporate Member Council
Join your friends and colleagues as we recognize the winners of the 2017 Best Overall PIC Paper, Best Overall Zone Paper, and Best Diversity Paper!
BEST OVERALL PIC PAPER: PIC V Paper: Exploring School-to-work Transitions through Reflective Journaling
Author: Benjamin Lutz and Marie Paretti, Virginia Tech
BEST OVERALL ZONE PAPER: ZONE IV Paper: "Assessment of Long-Term Effects of Technology Use in the Engineering Classroom"
Author: Sean St Clair, Oregon Institute of Technology
BEST DIVERSITY PAPER: Paper: "The Inequality of LGBTQ Students in U.S. Engineering Education: Report on a Study of Eight Engineering Programs"
Nominated by the Liberal Education/Education & Society Division Authors: Erin Cech, University of Michigan, Tom Waidzunas, Temple University, Stephanie Farrell, Rowan University
Corporate Member Council Industry Day Keynote Speaker
George Siemens researches, technology, networks, analytics, and openness in education. A professor and executive director of the Learning Innovation and Networked Knowledge Research Lab at University of Texas, Arlington, he also leads the development of the Center for Change and Complexity in Learning (C3L) at the University of South Australia. He has delivered keynote addresses in more than 35 countries on the influence of technology and media on education, organizations, and society. His work has been profiled in provincial, national, and international newspapers, radio, and television. He has served as PI or Co-PI on grants totaling more than $15 million, with funding from NSF, the Social Sciences and Humanities Research Council of Canada, Intel, Boeing, the Bill & Melinda Gates Foundation, and the Soros Foundation. He has received numerous awards, including honorary doctorates from Universidad de San Martin de Porres in Peru and the University of the Fraser Valley in Canada for his pioneering work in learning, technology, and networks. He holds an honorary professorship with University of Edinburgh. A founding President of the Society for Learning Analytics Research, he has advised government agencies in Australia, the European Union, Canada and the United States—as well as numerous international universities—on digital learning and utilizing learning analytics for assessing and evaluating productivity gains in the education sector and improving learner results. He is also a pioneer of massive open online courses (MOOCs).

T304 - Biomedical Division Poster Session
11:30 a.m. - 1:00 p.m., Exhibit Hall A B & C, Convention Center - Salt Palace

Schedule subject to change: Please go to www.asee.org/icp for up to date information
## Conference Sessions

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<td>Work in Progress: Do It Early and Do It Often: Engineering Math for First-Term EE Students</td>
<td>Wierer</td>
<td>Jay</td>
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<tr>
<td>80</td>
<td>22524</td>
<td>Work in Progress: Implementation of Electrostatics Tutorials Utilizing an Electronic Response System in Upper Level Electromagnetics</td>
<td>Young</td>
<td>Matthew</td>
</tr>
</tbody>
</table>

**T306 - Civil Engineering Division Poster Session**

11:30 a.m. - 1:00 p.m., Exhibit Hall A B & C, Convention Center - Salt Palace

**Sponsor: Civil Engineering Division**

Grab your lunch and talk to your colleagues about their exciting work!

- **A Project-based Learning Method to Teach Concepts of Viscoelasticity and its Applications to Seniors and Graduate Students in Biomedical, Civil, Chemical, and Mechanical Engineering**
  - Dr. Yussafi A Mehta, Rowan University
  - Analysis of a Trial of Mentoring between Civil Engineering Students and Practicing Engineers
  - Dr. Ronald Welch, The Citadel
  - Dr. Kevin C Bower P.E., The Citadel

**Integration of SHRP2 Solutions into Civil Engineering Curricula at Rowan, Temple, Villanova, and West Virginia Universities**
  - Dr. Yussafi A Mehta, Rowan University
  - Dr. Ayman Ali, Rowan University
  - Dr. Parth Bhavsar, Rowan University
  - Dr. Serti Park, Villanova University
  - Dr. Kakan C Dey, West Virginia University

**Making the Case for Temporary Structures as a Required Course and Recommending an Instructional Design**
  - Dr. George Okere, Washington State University
  - Mr. Chris Souder MS, California State University, Chico

**Peer Mentoring for All: Investigating the Feasibility of a Curricular-Embedded Peer Mentoring Structure**
  - Dr. Molly A. McVey, University of Kansas
  - Dr. Caroline R. Bennett P.E., University of Kansas
  - Dr. William N Collins, University of Kansas
  - Prof. Remy Lequesne, University of Kansas
  - Dr. Carl W. Luchies, University of Kansas
  - Dr. Sara E Wilson, University of Kansas
  - Dr. Elaina J. sutley, University of Kansas
  - Dr. William N. Collins, University of Kansas

**Playing Relieves Stress...Concentrations!**
  - Dr. Ronald W. Welch, The Citadel

**Using 3-D Printing in a Laboratory Setting to Teach Design Principles**
  - Dr. Suzette R Burckhard, South Dakota State University
  - Calvin Wampol, South Dakota State University

**Using Mobile Learning to Improve Low Success Rate in Engineering Courses**
  - Dr. Zhaozhuo Jiang P.E., San Francisco State University
  - Mr. Alec William Maxwell, San Francisco State University
  - Prof. Yun Liu, Purdue University Northwest

**Transportation Engineering Education in the 21st Century: A**

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Schedule subject to change: Please go to www.asee.org/icp for up to date information
**Conference Sessions**

**T307 - College-Industry Partnerships Division Poster Session**

11:30 a.m. - 1:00 p.m., Exhibit Hall A B & C, Convention Center - Salt Palace

**Sponsor:** College Industry Partnerships Division

- Concept Map-based Aviation Competency Mapping and Training
  - Dr. Yueltong Lin, Embry-Riddle Aeronautical University, Worldwide
  - Dr. Ali Mehran Shahhosseini, Indiana State University
  - Prof. Christian Janke, Embry Riddle Aeronautical University
  - Dr. M. Affan Badar, Indiana State University

- Industry and Academia: Together Spells Success
  - Dr. Raymond Edward Floyd, Northwest College

- Investigation of Factors Promoting Competitive Candidates for Entry-level Bioengineering Positions
  - Dr. Marcia Pool, University of Illinois, Urbana-Champaign
  - Mrs. Madeline R Darling, University of Illinois at Urbana-Champaign
  - Gabriella Rose Dupont, University of Illinois, Urbana-Champaign

- STEM Education from the Industry Practitioners’ Perspective
  - Mr. David Dylan John, Georgia Southern University
  - Dr. Yunfeng Chen, Georgia Southern University
  - Dr. Shahnam Navae, Georgia Southern University
  - Prof. Weinan Gao, Georgia Southern University

- Social Cognitive Impact of Industry internships upon Engineering Technology Students Developing Professional Identity: a Case Study
  - Dr. Bobbi J. Spencer, Texas State University
  - Dr. Vedaraman Sriman, Texas State University
  - Dr. Kimberly Grau Talley P.E., Texas State University
  - Dr. Araceli Martinez Ortiz, Texas State University

**T308 - Computers in Education Division Poster Session**

11:30 a.m. - 1:00 p.m., Exhibit Hall A B & C, Convention Center - Salt Palace

**Sponsor:** Computers in Education Division

- Development of a Virtual Reality Educational Game for Waste Management: Attack of the Recyclops
  - Dr. Fadi Castronovo, California State University, East Bay
  - Dr. Semih Yilmaz, California State University, East Bay
  - Mr. Akarsh Rao, Immersive and Interactive Research Group
  - Mr. Walter Condori Jr., California State University, East Bay
  - Kuran Monga, STEM Educational Gaming Research Group
  - Miss Hadiiseh Gooranorimi, California State University, East Bay

**Tuesday, June 26**

- **Technology Enhanced Pre-Calculus Classrooms (Work in Progress)**
  - Dr. Melissa Danforth, California State University, Bakersfield
  - Dr. Charles Lam, California State University, Bakersfield
  - Dr. Ronald Hughes, CSU, Bakersfield

- **ROS as an Undergraduate Project-based Learning Enabler**
  - Dr. Stephen Andrew Willkerson P.E., York College of Pennsylvania
  - Dr. Stephen Andrew Gadsden, University of Guelph
  - Mr. Andrew Lee, University of Guelph
  - Mr. Robert Nicholas Vandemark, Miss Elyse Hill,
  - Ms. Amy Domenique Gadsden, University of Alberta

  - Mrs. Mourya Reddy Narasareddygari,
  - Dr. Gursimran Singh Walia,
  - Mr. Alex Radermacher, North Dakota State University
  - Dr. Otto Borchert, North Dakota State University

- **Applications of Artificial Intelligence in Peer Assessment**
  - Dr. Edward F. Gehringer, North Carolina State University
  - Dr. Ferry Pramudianto, North Carolina State University
  - Mr. Abhinav Medhekar, North Carolina State University
  - Mr. Chandrasekar Rajasekar, crajase@ncsu.edu
  - Zhongcan Xiao, North Carolina State University

- **Work in Progress: Developing Engineering Students’ Professional Development Skills through Augmented and Virtual Reality Gaming Environments**
  - Mr. Matthew Nelson, Iowa State University
  - Dr. Benjamin Ahn, Iowa State University

- **Work in Progress: Constructing a Prediction Model of Creativity and Cognitive Concept Connections Based on Learning Portfolio**
  - Prof. Ting-Ting Wu, Graduate School of Technological and Vocational Education, National Yunlin University of Science and Technology
  - Prof. Yueh-Min (Ray) Huang, Cheng-Kung University
  - Mr. Pei-Yu Cheng, Dept. of Engineering Science, National Cheng Kung University

- **Work in Progress: Integrating Computational Thinking in STEM Education through a Project-based Learning Approach**
  - Dr. Duzhi Yang, Boise State University
  - Steve R Swanson,
  - Prof. Bhaskar B. C. Chittoori, Boise State University
  - Dr. Youngkyun Baek, Boise State University

- **Work in Progress: Exploring the Method to Design an Equal Engineering Class Environment for Students’ Collaborative Learning under Head-mounted Display Virtual Reality (HMD VR) Condition**
  - wen huang, Arizona State University, Polytechnic campus

- **Work in Progress: Introductory Mobile Robotics and Computer Vision Laboratories Using ROS and MATLAB**
  - Mr. Robert L. Avanzato, Pennsylvania State University,

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Tuesday, June 26

Conference Sessions

Abington
Mr. Cullen G Wilcox, Penn State Great Valley

T309 - Construction Division Poster Session
11:30 a.m. - 1:00 p.m., Exhibit Hall A B & C, Convention Center - Salt Palace
Sponsor: Construction Engineering Division
Moderator: Norman Philipp, Pittsburg State University

Assessment of Scientific Literacy Skills and Attitudes of Undergraduate Construction Management Students
Dr. Andrea Nana Ofori-Boadu, North Carolina A&T State University

T310 - New This Year! Texas Instruments Robotics Pavilion
11:30 a.m. - 1:00 p.m., Exhibit Hall A B & C, Convention Center - Salt Palace
Sponsor: Sponsored Sessions
Check out TI’s robotics pavilion #1031 for live robotics demos and challenges!
Sunday, Jun 25th: DSTR Robot from 6 – 7:30p.m.
Monday, June 26th: TI-RSLK from 5 – 6p.m.
Tuesday, June 27th: TI-Innovator™ Rover from 11:30a.m. – 1p.m.

T315 - Electrical and Computer Division Poster Session
11:30 a.m. - 1:00 p.m., Exhibit Hall A B & C, Convention Center - Salt Palace
Sponsor: Electrical and Computer Division
Moderator: Steve Watkins, Missouri University of Science & Technology

Establish Feedback Loops in an Electrical Engineering Core Course with Adaptive Release
Dr. Yufang Jin, University of Texas, San Antonio
Dr. Timothy Yuen, University of Texas at San Antonio
Stephanie Ann Garcia, University of Texas, San Antonio
Mrs. Robin Lynn Nelson, University of Texas at San Antonio
Mr. Ruitao Jin, University of Texas, San Antonio

A Wearable Electrocardiograph as a Means to Combine Measurement and Makerspace Concepts in a Biomedical Instrumentation Course Sequence
Dr. Steve Warren, Kansas State University
Mr. Charles Carlson, Kansas State University
Mr. Andrew McKittrick, Kansas State University
Ms. Shangxian Wang,

The Sensor Signal and Information Processing REU Site
Prof. Andreas S Spanias, Arizona State University
Prof. Jennifer M Blain Christen,
Dr. Trevor J Thornton, Arizona State University
Karen S. Anderson, Arizona State University
Dr. Michael Goryll, Arizona State University
Hany M Araf a, Arizona State University
Mr. Uday Shankar Shanthamallu, SenSIP, ASU

Erica S Forzani Forzani, Arizona State University
Dr. Heather M Ross, Arizona State University
Wendy M. Barnard,
Dr. Sule Ozev,
Work in Progress: Do It Early and Do It Often – Engineering Math for First-Term EE Students
Dr. Jay Wierer, Milwaukee School of Engineering
Dr. Jennifer L Bonniwell, Milwaukee School of Engineering
Dr. Sheila Ross, Milwaukee School of Engineering
Dr. Richard W. Kelnhofer, Milwaukee School of Engineering

Work in Progress: Reinforcement of Engineering Education with Hands on Learning of Through Technical Skills
Mr. Thomas Vernon Cook, University of Pittsburgh
Mr. James Arthur Lyle, University of Pittsburgh
Dr. Robert J Kerestes, University of Pittsburgh
Work in Progress: Reinventing the Undergraduate Electrical Engineering Curriculum to Address Tomorrow’s Cross-Disciplinary Global Challenges
Prof. Jamie Phillips, University of Michigan
Dr. Cynthia J. Finelli, University of Michigan
Dr. Khalil Najafi, University of Michigan
Dr. Lisa R. Lattuca, University of Michigan

Work in Progress: A Study of Transparent Assignments and Their Impact on Students in an Introductory Circuit Course
Dr. Jack Ou, California State University, Northridge

Work in Progress: An Analysis of Correlations in Student Performance in Core Technical Courses at a Large Public Research Institution’s Electrical and Computer Engineering Department
Mr. Christopher Robbiano, Colorado State University
Dr. Anthony A. Maciejewski, Colorado State University
Prof. Edwin K. P. Chong Ph.D., Colorado State University

Work in Progress: Implementation of Electrostatics Tutorials Utilizing an Electronic Response System in Upper Level Electromagnetics
Dr. Matthew Garrett Young, Arkansas Tech University
Dr. Jessica Patricia Conry, Arkansas Tech University
Dr. Edward Carl Greco Jr., Arkansas Tech University

Trending Mistakes in Signals and Systems courses
Dr. Farrah Fayyaz, Concordia University

T318 - Engineering Design Graphics Division Poster Session
11:30 a.m. - 1:00 p.m., Exhibit Hall A B & C, Convention Center - Salt Palace

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Schedule subject to change: Please go to www.asee.org/icp for up to date information
### Conference Sessions

**Tuesday, June 26**

#### T319 - Engineering Economy Division Poster Session

11:30 a.m. - 1:00 p.m., Exhibit Hall A B & C, Convention Center - Salt Palace  
**Sponsor:** Engineering Economy Division

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<th>Title</th>
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<tbody>
<tr>
<td>83</td>
<td>21548</td>
<td>Active Learning Module Development for At-risk Learners in Engineering Graphics</td>
<td>Clark</td>
<td>Aaron</td>
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<tr>
<td>84</td>
<td>21082</td>
<td>CADCompare: A Web-based Application that Compares PDF CAD Drawings</td>
<td>Webster</td>
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#### T320 - Engineering Ethics Division Poster Session

11:30 a.m. - 1:00 p.m., Exhibit Hall A B & C, Convention Center - Salt Palace

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<tbody>
<tr>
<td>85</td>
<td>22376</td>
<td>Risk Management and Ethics in Capstone Design</td>
<td>DeBartolo</td>
<td>Elizabeth</td>
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<tr>
<td>86</td>
<td>21752</td>
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<td>Kenneth</td>
</tr>
<tr>
<td>87</td>
<td>23163</td>
<td>Learner Types: A Means to Expand the Definition of Diversity and to Redesign Ethics Modules</td>
<td>Foley</td>
<td>Rider</td>
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<td>88</td>
<td>22532</td>
<td>Concerning Professional Licensure for Civil Engineering Faculty: A Matter of Best Practice</td>
<td>Payne</td>
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<td>89</td>
<td>22995</td>
<td>Tools to Assist with Collection and Analysis of Ethical Reflections of Engineering Students</td>
<td>Taraban</td>
<td>Roman</td>
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#### T321 - Engineering Libraries Division Poster Session

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<tr>
<td>92</td>
<td>22892</td>
<td>Ten Ways Academic Libraries Can Help their Departments Increase Retention of Women Engineering Students</td>
<td>Bossart</td>
<td>Jean</td>
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<td>93</td>
<td>21798</td>
<td>Engineering Graduate Student Information Literacy: Are We Meeting the Need?</td>
<td>Grochowski</td>
<td>Paul</td>
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<td>Making All the Gears Drive the Machine: New Library Collections and Services for Starting a Mechanical Engineering Program</td>
<td>Peterson-Fairchild</td>
<td>Kelly</td>
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<td>95</td>
<td>21224</td>
<td>Leveraging Python to Improve Quality of Metadata of Engineering Faculty Publication Records</td>
<td>Zhang</td>
<td>Qianjin</td>
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#### T325 - Environmental Engineering Division Poster Session

11:30 a.m. - 1:00 p.m., Exhibit Hall A B & C, Convention Center - Salt Palace

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<tr>
<td>96</td>
<td>22295</td>
<td>Sustainable Development Goals Meet ‘Third Mission’: The Engineers Without Borders Challenge in Germany</td>
<td>Haberstroh</td>
<td>Max</td>
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<td>97</td>
<td>22123</td>
<td>A Case Study of Interdisciplinary Capstone Engineering Design</td>
<td>Hunt</td>
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<td>98</td>
<td>22698</td>
<td>Collaboratively Developing an Introductory Infrastructure Systems Curriculum: The One Water Module</td>
<td>Parker</td>
<td>Philip</td>
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Schedule subject to change: Please go to [www.asee.org/icp](http://www.asee.org/icp) for up to date information.
**Conference Sessions**

**T327 - First-Year Programs Division Poster Session**
11:30 a.m. - 1:00 p.m., Exhibit Hall A B & C, Convention Center - Salt Palace

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<tr>
<td>99</td>
<td>23727</td>
<td>Comparing Peer Evaluations of Teamwork Behavior by K-12 Students vs. First-year Engineering Students</td>
<td>Ferguson</td>
<td>Daniel</td>
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**T329 - Industrial Engineering Division Poster Session**
11:30 a.m. - 1:00 p.m., Exhibit Hall A B & C, Convention Center - Salt Palace

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<tr>
<td>100</td>
<td>22477</td>
<td>Truck-Drone Two-tier Delivery Network Design</td>
<td>SHIM</td>
<td>SANG-HO</td>
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<td>101</td>
<td>22483</td>
<td>A Steepest Edge Rule for a Column Generation Approach to the Convex Recoloring Problem</td>
<td>SHIM</td>
<td>SANG-HO</td>
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**T332 - International Engineering Education Poster Session**
11:30 a.m. - 1:00 p.m., Exhibit Hall A B & C, Convention Center - Salt Palace

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<tr>
<td>102</td>
<td>24542</td>
<td>SRobot Project</td>
<td>Binh Do</td>
<td>Phuong</td>
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<td>103</td>
<td>23809</td>
<td>Comparison of Engineering Honors Education in America and China: Based on the Analysis of Course Syllabi in the First-year Program and Experimental Class</td>
<td>FU</td>
<td>Jiaojiao</td>
</tr>
<tr>
<td>104</td>
<td>21408</td>
<td>The Online Tutorial Room (OTR): Improving the Sampling Frequency of the Engineering Knowledge Signal!</td>
<td>Hassoun</td>
<td>George</td>
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<tr>
<td>105</td>
<td>24541</td>
<td>Maker Education in a Sino-American Joint Institute: Taking Sichuan University - Pittsburgh Institute as an Example</td>
<td>Lin</td>
<td>Senbao</td>
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<td>106</td>
<td>21943</td>
<td>Teaching Engineering, Teamwork, and Tolerance by Bringing Multidisciplinary, Multicultural Students Together via a Project of Common Interest: Vertical, Hydroponic, Smart Garden With Global and Universal (Space) Applications (Student Poster-Paper)</td>
<td>Ruiz-Carpio</td>
<td>Miguel</td>
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<tr>
<td>107</td>
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<td>Leveraging the Tech-savvy Next-generation Talents and Hackathon Techniques to Accelerate Digital Enterprise Journey and Space-related Endeavors</td>
<td>Taratukhin</td>
<td>Victor</td>
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<td>108</td>
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<td>Improving Freshman Students’ Success Using “Tracking”</td>
<td>Waychal</td>
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<td>109</td>
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<td>A Preliminary Phosphate Study of Selected Sites Along the Shanghai Tributary of the Yangtze River: Undergraduate International Students’ Freshman Project in an Interconnected World (Student Poster-Paper)</td>
<td>Ying</td>
<td>Junyi</td>
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## Conference Sessions

### Tuesday, June 26

**T333 - Pre-College Engineering Education Division Poster Session**

11:30 a.m. - 1:00 p.m., Exhibit Hall A B & C, Convention Center - Salt Palace

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<tr>
<td>114</td>
<td>22577</td>
<td>Impact of a STEM-focused Research Program on Minority High School Students' Self-efficacy and Interest in STEM Research and Careers (Work in Progress)</td>
<td>Baldwin</td>
<td>Tameshia</td>
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<td>115</td>
<td>22894</td>
<td>Elementary Students' Disciplinary Practices During Integrated Science and Engineering Units (Work in Progress)</td>
<td>Batrouny</td>
<td>Nicole</td>
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<td>116</td>
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<td>Implementation of an Engineering Summer Camp for Early-elementary Children (Work in Progress)</td>
<td>Bottomley</td>
<td>Laura</td>
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<td>117</td>
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<td>Innovative Mars Exploration Education and Technology Program: Development of an Informal Learning Curriculum (Work in Progress)</td>
<td>Carnasciali</td>
<td>Maria-Isabel</td>
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<td>University-based Engineering Training of High School Science Teachers to Implement the Next Generation Science Standards (Work in Progress)</td>
<td>Christian</td>
<td>Kimberly</td>
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<td>119</td>
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<td>Innovating Teamwork Instruction in High School: Using Pandemic (Work in Progress)</td>
<td>Garcia</td>
<td>Joshua</td>
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<td>120</td>
<td>22780</td>
<td>Growth from the STEM: Exploring an International Model of Apprenticeship for Outreach Programs (Work in Progress)</td>
<td>Gerrard</td>
<td>Darlee</td>
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<tr>
<td>121</td>
<td>21596</td>
<td>Examining the Literacy Practices of Engineers to Develop a Model of Disciplinary Literacy Instruction for K-12 Engineering (Work in Progress)</td>
<td>Green</td>
<td>Theresa</td>
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<td>122</td>
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<td>Influence of an Entrepreneurial Mindset on P-12 Students’ Problem Framing (Work in Progress)</td>
<td>Kim</td>
<td>Eunhye</td>
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<td>123</td>
<td>22905</td>
<td>Examining the Interactions Related to Role Modeling in an Elementary Outreach Program (Work in Progress)</td>
<td>Miel</td>
<td>Karen</td>
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<tr>
<td>124</td>
<td>23525</td>
<td>A Project-based Approach to Develop Engineering Design Process Skills Among High School Students (Work in Progress)</td>
<td>Mon</td>
<td>Mi</td>
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<td>125</td>
<td>22027</td>
<td>Neuroscience and Engineering: Interdisciplinary STEAM Curriculum at a Girls’ Middle School (Work in Progress)</td>
<td>Pang</td>
<td>Phelana</td>
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<td>126</td>
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<td>Integrating Authentic Engineering Design into a High School Physics Curriculum (Work in Progress)</td>
<td>Pike</td>
<td>Alexandra</td>
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<td>127</td>
<td>22516</td>
<td>Engineering Projects in Community Service (EPICS) High: Preliminary Findings Regarding Learning Outcomes for Underrepresented Students (Work in Progress, Diversity)</td>
<td>Spence</td>
<td>Tameka</td>
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### Tuesday, June 26

#### T335 - Make It!
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<tr>
<td>128</td>
<td>21792</td>
<td>Engaging Underrepresented Students in Engineering Through Targeted and Thematic Summer Camp Content (Work in Progress, Diversity)</td>
<td>Warren</td>
<td>Amy</td>
</tr>
<tr>
<td>129</td>
<td>21746</td>
<td>Gatekeepers to Broadening Participation in Engineering: A Qualitative Investigation of a Case Site in Virginia (Work in Progress)</td>
<td>Andrew</td>
<td></td>
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#### T338 - Mechanical Engineering Division Poster Session
11:30 a.m. - 1:00 p.m., Exhibit Hall A B & C, Convention Center - Salt Palace

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<td>Krishnamurthy</td>
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#### T341 - Multidisciplinary Engineering Division Poster Session
11:30 a.m. - 1:00 p.m., Exhibit Hall A B & C, Convention Center - Salt Palace

Sponsor: Multidisciplinary Engineering Division

#### T345 - Engineering Physics & Physics Division Poster Session
11:30 a.m. - 1:00 p.m., Exhibit Hall A B & C, Convention Center - Salt Palace

Sponsor: Engineering Physics and Physics Division
Conference Sessions

Tuesday, June 26

T346 - Software Engineering Division Poster Session
11:30 a.m. - 1:00 p.m., Exhibit Hall A B & C, Convention Center - Salt Palace
Sponsor: Software Engineering Division

T347 - Student Division Poster Session
11:30 a.m. - 1:00 p.m., Exhibit Hall A B & C, Convention Center - Salt Palace
Sponsor: Student Division

Exploring Design Failure in the Design Process: A comparative case study of young engineering students
Jessica Cellitti, Drexel University
EEGR6 Poster: Laboratory Improvements for Mechanical Engineering (Phase 2)
Mr. Joseph Michael Derrick, Indiana University Purdue University Indianapolis
Mr. Michael Golub, Indiana University Purdue University, Indianapolis
Mr. Vaibhav R. Shrivastav,
Change Agents for Broadening Participation in Engineering: A System Analysis of Deans, Faculty, and Engineering Student Support Center Administrators
Ms. Cynthia Hampton, Virginia Tech

T348 - Systems Engineering Division Poster Session
11:30 a.m. - 1:00 p.m., Exhibit Hall A B & C, Convention Center - Salt Palace
Sponsor: Systems Engineering Division

T349 - Technological and Engineering Literacy/Philosophy of Engineering Division Poster Session
11:30 a.m. - 1:00 p.m., Exhibit Hall A B & C, Convention Center - Salt Palace
Sponsor: Technological and Engineering Literacy/Philosophy of Engineering Division

T350 - Two-Year College Division Poster Session
11:30 a.m. - 1:00 p.m., Exhibit Hall A B & C, Convention Center - Salt Palace

T355 - Poster Session - Engineering Leadership Development Division
11:30 a.m. - 1:00 p.m., Exhibit Hall A B & C, Convention Center - Salt Palace

T396A - FOCUS ON EXHIBITS: Lunch & ASEE Division Poster Sessions
11:30 a.m. - 1:00 p.m., Exhibit Hall A B & C, Convention Center - Salt Palace
Sponsor: ASEE Headquarters

ASEE Division Poster Sessions are available for perusing over lunch. And if there's a booth you've yet to explore, this closing Exhibit Hall session will be your last chance.

T402 - Architectural Division Business Meeting
1:30 p.m. - 3:00 p.m., Room 251 E, Convention Center - Salt Palace
Sponsor: Architectural Engineering Division
Architectural Division business meeting.

T404 - Extra-curricular Programs Related to BME Education
1:30 p.m. - 3:00 p.m., Room 254 A, Convention Center - Salt Palace
Sponsor: Biomedical Engineering Division
Moderator: Richard Goldberg, University of North Carolina, Chapel Hill
Speakers: Mr. Samuel Elliot Krause Krause; Tanya M. Nocera

Schedule subject to change: Please go to www.asee.org/icp for up to date information
Tuesday, June 26

T4100 - INDUSTRY DAY: The Lifelong Learning Pathway of the Global Engineer
1:30 p.m. - 3:00 p.m., Room 151 D, Convention Center - Salt Palace
Sponsor: Corporate Member Council
Moderator: Erica Messinger, Keysight Technologies
Moderator:
Erica Messinger, Director, Worldwide University Development, Keysight Technologies

Panelists:
Cynthia Murphy-Ortega, Manager, University Partnerships and Association Relations, Chevron Corporation
Howard Appelman, Associate Technical Fellow, Boeing
Ye Cheng, Education Technical Evangelist, MathWorks

T4104 - ETC Business Meeting
1:30 p.m. - 3:00 p.m., Room 250 B, Convention Center - Salt Palace
Sponsors: Engineering Technology Council; Engineering Technology Division
Engineering Technology Council business meeting.

T4109A - Sponsor Technical Session: Engineering Licensure: Education, Examinations, and Experience—Presented By NCEES

Schedule subject to change: Please go to www.asee.org/icp for up to date information
Conference Sessions  

1:30 p.m. - 3:00 p.m., Room 150 B - Sponsor Tech Room, Convention Center - Salt Palace  

Sponsor: Sponsored Sessions  

Speakers: David Whitman, Ph.D., P.E., University of Wyoming, retired; John Steadman, Ph.D., P.E., University of South Alabama  

Description: While each state licensing board has its own laws regarding engineering licensure, there is a general three-step process for licensing candidates: education, examinations, and experience. This presentation features a closer look at the engineering licensure process and taking the Fundamentals of Engineering (FE) exam, the first step toward becoming a licensed professional engineer (P.E.). Attend and learn more about how you and your students can join a national community of professionals committed to excellence.

T4109B - Sponsor Technical Session: Easy Teaching of Embedded Systems and Microprocessors Courses with TI MSP432 LaunchPad—Presented by Texas Instruments  

1:30 p.m. - 3:00 p.m., Room 150 A - Sponsor Tech Room, Convention Center - Salt Palace  

Sponsor: Sponsored Sessions  

Join Texas Instruments for a look at how to implement the low-cost and flexible TI LaunchPad development kits into embedded systems courses. TI and academic partners provide many resources to teach microprocessor concepts at a level appropriate for university students. Students will get hands-on with industry tools while also having the flexibility to do their hardware labs in their own time and locations of choice. The MSP432 provides students with a very solid, popular, and reliable ARM Cortex-M4 architecture to build their skills covering low-level concepts or more advanced systems-level concepts. Presenters: Mark Easley, Texas Instruments; and Jason Rubadue, Texas Instruments  

Snacks will be provided.

T4109C - Sponsor Technical Session: Presented by the University of Maryland  

1:30 p.m. - 3:00 p.m., Room 150 C - Sponsor Tech Room, Convention Center - Salt Palace  

Sponsor: Sponsored Sessions  

This session will focus on curriculum and teaching methods that can put engineering schools at the forefront of first-year education and significantly decrease rates of attrition among undergraduates.

T411 - Postcard Roundtable: Preparing Co-Op and Internship Students for the Engineering Workforce  

1:30 p.m. - 3:00 p.m., Salon D, HQ Hotel - Marriott at City Creek  

Sponsors: Cooperative and Experiential Education Division; Engineering Ethics Division  

Moderators: Lisa Massi, University of Central Florida; Diane LaFreniere, Grand Valley State University  

Speakers: Mrs. Mary Andrade, University of Louisville; Dr. Sandra English, Cleveland State University; Dr. Jonathan Beever, University of Central Florida  

Since its founding in 1906 by Herman Schneider, engineering dean at the University of Cincinnati, the co-op model (and by extension internships) has been adopted by many schools. While the co-op goal and model have not fundamentally changed in over a century, workforce demands have changed, and with them, the challenges that co-op practitioners and faculty administrators face. This panel session will cover various aspects of preparing co-op and internship students to transition from school to the engineering workforce (and back to school). This is an interactive session. Speakers will give brief presentations, after which attendees will have the opportunity to discuss topics in further detail with individual speakers in a roundtable format.

T4112 - Understanding Diversity, Equity, and Inclusion from Students’ Perspectives  

1:30 p.m. - 3:00 p.m., Room 151 A, Convention Center - Salt Palace  

Sponsor: ASEE Diversity Committee  

Moderator: Fethiye Ozis, Northern Arizona University  

These papers explore students’ understanding of engineering cultures. They consider student views of diversity, equity, and inclusion from personal and climate perspectives.

T4110A - Addressing Changing Workforce Demands  

1:30 p.m. - 3:00 p.m., Room 151 B, Convention Center - Salt Palace  

Sponsor: ASEE Internship Committee  

Moderator: Jennifer Haywood, University of Cincinnati  

How Granular is the Problem? A Discipline-specific Focus Group Study of Factors Affecting Underrepresentation in Engineering Undergraduate Programs  

Dr. Amy Truth, University of Delaware  

Dr. Tia Navelene Barnes, University of Delaware  

Prof. Jenni Buckley, University of Delaware

Schedule subject to change: Please go to www.asee.org/icp for up to date information
Conference Sessions

Tuesday, June 26

Prof. Joshua A. Enszer, University of Delaware
Dr. Sarah Ilhanpour Rooney, University of Delaware
Dr. Rachel Davidson, University of Delaware
Xiaoxue ‘Vera’ Zhang, University of Delaware
Investigating Student Perceptions of an Engineering Department’s
Climate: The Role of Peer Relations
Dr. Susannah C. Davis, Oregon State University
Naeun Cheon, University of Washington
Ms. Elba Camila Moise, University of Washington
Dr. Susan Bobbitt Nolen, University of Washington
Preliminary Findings of a Phenomenological Study of Middle
Eastern Women’s Experiences Studying Engineering in Ireland
Prof. Shannon Massie Chance, University College London &
Dublin Institute of Technology &
Dr. Bill Williams, Instituto Politécnico de Setúbal

T4113 - DEED Postcard Poster Session
1:30 p.m. - 3:00 p.m., Room 255 E, Convention Center - Salt Palace
Sponsor: Design in Engineering Education Division
Moderator: Jessica Kuczynski, Santa Clara University
Four work-in-progress posters are presented as postcards for brief
introduction followed by a “gallery walk”-type discussion. The student
essay winners will also be presented in this session.

T4116A - ABET SESSION: Becoming a Program
Evaluator Might Be For You!
1:30 p.m. - 3:00 p.m., Room 150 D, Convention Center - Salt Palace
Sponsor: ABET Sponsored Sessions
Each year, more than 2,000 academic
administrators and faculty, industry and government officials, and
technical professionals serve as ABET program evaluators, making
initial accreditation recommendations and working together to ensure
quality in technical education worldwide. This session provides
information for prospective ABET volunteers and covers:
1) ABET’s need for new volunteers
2) The nature of program evaluator work
3) What’s in it for you?
4) Threshold requirements for service and the program evaluator
selection process
5) Training requirements
6) The program evaluator “life-cycle”

T413B - Design and the Capstone Experience
1:30 p.m. - 3:00 p.m., Room 155 C, Convention Center - Salt Palace
Sponsor: Design in Engineering Education Division
Breaking Down the Silos with an Integrated Laboratory
Experience
Dr. Barbara E. Marino, Loyola Marymount University
Continued Development of an Integrated Capstone Design
Curriculum
Dr. Shayne Kelly McEmony, Florida A&M University/
Florida State University
Dr. Ruturaj Soman,
Dr. Nikhil Gupta, Florida A&M University/Florida State
University
Dr. Chiang Shih, Florida A&M University/Florida State
University
Navigating Process-Product Tensions using a Design Canvas
Dr. R. Alan Cheville, Bucknell University

Schedule subject to change: Please go to www.asee.org/icp for up to date information
## Conference Sessions

### T414A - Motivation, Attitudes, and Beliefs
1:30 p.m. - 3:00 p.m., Room 355 C, Convention Center - Salt Palace
Sponsor: Educational Research and Methods Division
Moderators: Nathan McNeill, University of Colorado, Boulder; Noah Salzman, Boise State University

**Educational Research and Methods Division Technical Session**

*Cluster Analysis Methods and Future Time Perspective Groups of Second-Year Engineering Students in a Major-Required Course*
- Dr. Justine Chasmar, Goucher College
- Ms. Katherine M. Ehlett, Clemson University

*Fitting In Across STEM: Comparing Science/Math and Engineering/Technology Students’ Perceptions of Their Fields and Futures*
- Heather Lee Perkins, North Carolina State University
- Mary Wyer,

*Validation of an Interview Protocol to Explore Students’ Beliefs about Intelligence*
- Allison Adams, Kansas State University
- Dr. Amy Rachel Betz, Kansas State University
- Dr. Emily Dringenberg, Ohio State University

*Developing a Measure of Engineering Students’ Makerspace Learning, Perceptions, and Interactions*
- Sarah Lanci, Colorado Mesa University
- Dr. Louis Nadelson, Colorado Mesa University
- Dr. Idalis Villanueva, Utah State University
- Dr. Jana Bouwha-Gearhart, Oregon State University
- Katherine L. Youmans, Utah State University
- Dr. Adam Lenz, Oregon State University

*Motivational Attitudes and Behaviors in Capstone Projects: Quantitative Validation of Assessment Instruments*
- Bashirah Ibrahim, Ohio State University
- Dr. Peter Rogers, Ohio State University
- Dr. Denny C. Davis, Ohio State University
- Lin Ding, Ohio State University
- Kaycee Ash, Ohio State University

*Intersecting Self-Efficacy and Interest: Exploring the Impact of Soft Robot Design Experiences on Engineering Perceptions*
- Mr. Andrew Jackson, Purdue Polytechnic Institute
- Prof. Nathan Mentzer, Purdue Polytechnic Institute
- Prof. Rebecca Kramer-Bottiglio, Yale University

### T414C - Identity and Engineering Education Research: Topics, Issues, Trends
1:30 p.m. - 3:00 p.m., Room 355 D, Convention Center - Salt Palace
Sponsor: Educational Research and Methods Division
Moderators: Nicole Pitterson, Virginia Polytechnic Institute & State University; Amardeep Kaur, Missouri University of Science & Technology

**Educational Research and Methods Division Technical Session**

*Open Educational Resources in the Undergraduate Engineering Curriculum: A Materials Science Case Study*
- Mr. Amir Bebbaharian, Utah State University
- Erin L. Davis, Utah State University
- Prof. Nick A. Roberts, Utah State University

*Integration of Research Topics into Undergraduate Information Technology Courses and Projects*
- Dr. George Stefanek, Purdue University Northwest
- Dr. Niranjan Hemant Desai, Purdue University Northwest

*Efforts to Improve Undergraduate Grader Consistency: A Qualitative Analysis*
- Nathan M. Hicks, Purdue University, West Lafayette (College of Engineering)
- Dr. Kerrie A. Douglas, Purdue University, West Lafayette (College of Engineering)

*A Study of the Testing Effect in an Engineering Classroom*
- Dr. Monica H. Lamm, Iowa State University
- Miss Shuting Yan, Iowa State University
- Clark R. Coffman,
- Dr. Carly L. Manz, Iowa State University
- Dr. Robert D Reason, Iowa State University

*Instructional Strategies in K-12 Informal Engineering Education - Deep Case Study Approaches to Educational Research*
- Dr. Sarah Hug, Colorado Evaluation & Research Consulting
- Dr. Suzanne Eyerman, Fairhaven Research and Evaluation Research on Comprehensive Quality Evaluation System of Engineering Undergraduates Based on Developmental Evaluation: Taking X University as an Example
- Ms. Zhi Fang, Beihang University
- Prof. Shuting Ding, Beihang University
- Prof. Qing Lei, Beihang University
- Ms. Dandan Hou, Beihang University

### T414B - Practice II: Curricular Innovations

Schedule subject to change: Please go to [www.asee.org/icp](http://www.asee.org/icp) for up to date information

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Prof. Michael S. Thompson, Bucknell University

*Literature Review and Methods Paper: Identifying Influencers That Contribute to Transformative Learning in an Electrical and Computer Engineering Undergraduate Capstone Design Project and Selecting Action Research Methods to Frame a Study*
- Dr. Rachael E. Cate, Oregon State University
- Donald Heer, Oregon State University

*Assessment of an Industry-Sponsored Mechatronics Capstone Design Project*
- Dr. Matthew Quincy Marshall, Kennesaw State University
- Dr. Chan Ham, Kennesaw State University
T414D - Works in Progress II
1:30 p.m. - 3:00 p.m., Room 355 B, Convention Center - Salt Palace
Sponsor: Educational Research and Methods Division
Moderators: Monica Cardella, Purdue University-Main Campus, West Lafayette (College of Engineering); Jacob Grohs, Virginia Tech
Educational Research and Methods Division Technical Session
WIP: Exploration of Conceptions and Attitudes of Colombian and American Chemical Engineers about Chemical Engineering
Ing. Cristián Eduardo Vargas Ordóñez, Universidad de los Andes
Dr. Mariana Tafur-Arciniegas, Universidad de los Andes
WIP: Student and Faculty Experience with Blended Learning in a First-Year Chemistry for Engineers Course
Dr. Eline Boghaert, University of Waterloo
Dr. Jason Grove P.E., University of Waterloo
WIP An Interview Study of Faculty, Course Assistant, and Student Insight within Teaching and Learning Assistant Programs for Undergraduate Engineering Courses
Hermín Gallegos, Tufts University
Dr. Kristen B. Wendell, Tufts University
Dr. Jessica E. S. Swenson, Tufts University, Center for Engineering Education and Outreach
WIP: Problem Solving in Introductory Engineering Science Courses
Rebecca LeBow, Tufts University
Dr. Kristen B. Wendell, Tufts University
Ms. Jessica E. S. Swenson, Tufts University, Center for Engineering Education and Outreach
WIP: Curricular Renewal for System Engineering: Project-based Capstone Framework to Hatch Autonomy and Creativity
Dr. Chao-Yang Cheng, National Chiao Tung University
Prof. Yu-Lun Huang, National Chiao Tung University
Prof. Bing-Fei Wu, National Chiao Tung University
Prof. Yon-Ping Chen, National Chiao Tung University
Prof. Sunny S. J. Lin, National Chiao Tung University
WIP: Unpacking the Black Box: How does a Cultural Engineering Student Organization Support the Persistence of Students of Color?
Tasha Zephirin, Purdue University, West Lafayette (College of Engineering)
Prof. Brent K. Jesiek, Purdue University, West Lafayette (College of Engineering)

T415A - Electrical and Computer Division Technical Session 5
1:30 p.m. - 3:00 p.m., Room 260 A, Convention Center - Salt Palace
Sponsor: Electrical and Computer Division
Moderator: Thomas Siller, Colorado State University
Using Student Video Presentations to Develop Communication Skills
Dr. Thomas J. Siller, Colorado State University
Dr. Anthony A. Maciejewski, Colorado State University
Ms. Andrea M. Leland, Colorado State University
Prof. Tom Chen, Colorado State University
Prof. Branislav M. Notaros, Colorado State University
Prof. Ali Pezeshki, Colorado State University
Prof. Sourajee Roy, Colorado State University
Mr. Adam C. Hicks, Colorado State University
Improving the Teaching and Learning of Writing through the Writing Studio Model
Dr. Michelle Miley, Montana State University
Dr. Todd Kaiser, Montana State University
Liz Kovalchuk, Montana State University
Automated Formation of Peer-learning Cohorts Using Computer-based Assessment Data: A Double-blind Study within a Software Engineering Course
Dr. Ronald F. DeMarra P.E., University of Central Florida
Dr. Damla Turgut, University of Central Florida
Dr. Edwin Nassiff, University of Central Florida
Salih Safa Bacanli, University of Central Florida
Neda Hajiakhoond Bidoki, University of Central Florida
Mr. Jun Xu, University of Central Florida
Assessing Scrum Project Management and Teamwork in Electrical and Computer Engineering Courses
Prof. Branimir Pejcinovic, Portland State University
Dr. Robert B. Bass, Portland State University
Mr. Phillip Wong, Portland State University
Active Techniques Implemented in an Introductory Signal Processing Course to Help Students Achieve Higher Levels of Learning
Dr. Saharnaz Baghdadchi, University of California, San Diego
Rebecca Anne Hardesty, University of California, San Diego
Mr. Paul Andreas Hadjipieris, University of California, San Diego
Dr. Jason Groves P.E., University of Central Florida
Dr. Eline Boghaert, University of Waterloo

T415B - IEEE Education Society Board of Governors Meeting
1:30 p.m. - 3:00 p.m., Room 251 C, Convention Center - Salt Palace
Sponsor: Electrical and Computer Division
T416 - The Incorporation of Bioenergy in STEM Curricula
1:30 p.m. - 3:00 p.m., Room 255 A, Convention Center - Salt Palace
Sponsor: Energy Conversion and Conservation Division
Moderators: Madhumi Mitra, University of Maryland, Eastern
Shore; Abhijit Nagchandhuri, University of Maryland, Eastern Shore
Speakers: Dr. Lynn A Albers, Campbell University; Dr. Ted Song, John Brown University; Dr. Serpil Guran, Director of Rutgers EcoComplex "Clean Energy Innovation Center"; Dr. Ibrahim H. Yeter, Purdue University-Main Campus, West Lafayette (College of Engineering); Dr. Ahmed H. Elsawy, Tennessee Technological University

Speakers in this diverse panel will present on how they have been incorporating Bioenergy content materials in P20 STEM curricula. This is a follow-up to the workshop on Bioenergy in P20 curricula hosted by the Energy Conversion and Conservation Division in Columbus, OH, in 2017. Attendees at the 2017 workshop, representing various engineering and science disciplines, received content materials and hands-on experiences on a number of activities pertaining to systems thinking, sustainability, bioheat, biopower, and biomass. Some of the participants from the 2017 workshop will be sharing their experiences about how they incorporated the workshop-related materials in their classrooms; and will reflect on the challenges and success with students’ learning outcomes.

Free ticketed event

T419 - Engineering Economy Division Technical Session 1
1:30 p.m. - 3:00 p.m., Room 150 F, Convention Center - Salt Palace
Sponsor: Engineering Economy Division
Moderator: Billy Gray, Tarleton State University

Incorporating Active Learning Strategies into an Engineering Economics Course
Dr. Ona Egbue, University of South Carolina, Upstate

Integrating Ethics in Undergraduate Engineering Economy Courses: An Implementation Case Study and Future Directions
Dr. James Burns, Purdue University, West Lafayette
Dr. Bob E. White P.E., Western Michigan University
Dr. Azim Houshyar, Western Michigan University

Work in Progress: Do Engineering Students Gain Financial Literacy Skills by Taking an Engineering Economy Course?
Aimee T. Ulstad, Ohio State University
Mehdi Mashayekhi, Ohio State University
Hannah Meckstroth, Ohio State University

Using the Education of Engineering Economy to Impact the Reduction of Engineering Student Loan Debt
Dr. Erick Jones, University of Texas, Arlington
Dr. Billy Gray, Tarleton State University

T421 - Engineering Libraries Division Technical Session 3
1:30 p.m. - 3:00 p.m., Room 155 F, Convention Center - Salt Palace
Sponsor: Engineering Libraries Division
Moderator: Laura Mosher, United States Military Academy

Applicability of Evidence-based Acquisition Model to Collection Development in Engineering Subjects

Schedule subject to change: Please go to www.asee.org/icp for up to date information
Conference Sessions

T424 - Entrepreneurship and Engineering Innovation Division Business Meeting
1:30 p.m. - 3:00 p.m., Room 250 D, Convention Center - Salt Palace
Sponsor: Entrepreneurship & Engineering Innovation Division

T427A - First-Year Programs Division - Visualization and Mathematics
1:30 p.m. - 3:00 p.m., Room 155 B, Convention Center - Salt Palace
Sponsors: First-Year Programs Division; Mathematics Division
Moderators: Robin Hensel, West Virginia University; Timothy Hinds, Michigan State University
Full paper presentations - mathematics, concept maps, free body diagrams, spatial visualization
An Application-Oriented Course to Improve Student Performance in Mathematics Courses
- Dr. Jaskirat Sodhi, New Jersey Institute of Technology
- Dr. Ashish Borgaonkar, NJIT
- Dr. Edwin Hou, New Jersey Institute of Technology
- Dr. Moshe Kam P.E., New Jersey Institute of Technology
Developing a Coding Rubric for Students’ Spatial Visualization Strategies
- Mrs. Adetoun Otudara Yeaman, Virginia Polytechnic Institute and State University
- Dr. Diana Baitakarova, Virginia Tech
- Prof. Tamara Knott, Virginia Tech
Student performance on drawing Free Body Diagrams and the effect on Problem Solving
- Dr. Jeffrey A Davis P.Eng., Grant MacEwan University
- Dr. Shelley Lorimer P.Eng., Grant MacEwan University
Impact of Initiatives for Helping First Year Students Start on Track in Mathematics Sequence
- Dr. Ashish Borgaonkar, NJIT
- Dr. Jaskirat Sodhi, New Jersey Institute of Technology
- Dr. Moshe Kam P.E., New Jersey Institute of Technology
- Dr. Edwin Hou, New Jersey Institute of Technology
Using Concept Maps to Assess Student Learning in a Multisession Introduction to Engineering Course
- Dr. Kristen L. Sanford Bernhardt P.E., Lafayette College
- Dr. Mary Roth P.E., Lafayette College

T427B - First-year Programs Division: Design
1:30 p.m. - 3:00 p.m., Room 155 D, Convention Center - Salt Palace

Tuesday, June 26

Sponsor: First-Year Programs Division
Moderators: Jaqi McNeil, University of Louisville; Krista Kecskemety, Ohio State University
This technical session includes five full paper presentations on topics related to first-year engineering design.

Introduction to Heat Transfer in a First-year Mechanical Engineering Course
- Dr. Dani Fadda, University of Texas, Dallas
- Dr. Oziel Rios, University of Texas, Dallas

A Conceptual Design Activity for a First-year Mechanical Engineering Course
- Dr. Oziel Rios, University of Texas, Dallas
- Dr. Dani Fadda, University of Texas, Dallas

Evolution of Cornerstone: Creating a First-year Culture with a Multifaceted Approach
- Dr. Richard Whalen, Northeastern University
- Dr. Susan F. Freeman, Northeastern University
- Ms. Jennifer Ocif Love, Northeastern University

Critical Thinking, Design Practices, and Assessment in a Fundamentals of Engineering Course
- Dr. Ryan Munden, Fairfield University
- Ms. Marcia Arambulo Rodriguez, Fairfield University

Evaluation of Online Learning in a First-year Engineering Design Course
- Dr. Liang Li Wu, University of California, Irvine
- Dr. Christian Fischer, University of California, Irvine
- Dr. Fernando Rodriguez, University of California, Irvine
- Dr. Gregory N. Washington, University of California, Irvine

T428 - The Care and Keeping of Graduate Students
1:30 p.m. - 3:00 p.m., Room 151 C, Convention Center - Salt Palace
Sponsors: Graduate Studies Division; New Engineering Educators Division; Student Division; Continuing Professional Development Division

Speakers: Catherine G.P. Berdanier, Pennsylvania State University, University Park; Katy Luchini Colbry, University Park; and Kristin E. Pohl, Pennsylvania State University, University Park
This session will offer theory-based best practices for research group leadership and management. As a result of this session, participants will be able to approach the “care and keeping” of their graduate students from a literature-based and scholarly perspective, noting elements of graduate socialization that affect student development, success, and persistence.

T429 - IED Technical Session: Preparing for the Future Through Projects and Research
1:30 p.m. - 3:00 p.m., Room 255 F, Convention Center - Salt Palace
Sponsor: Industrial Engineering Division
Moderator: Letitia Pohl, University of Arkansas

Schedule subject to change: Please go to www.asee.org/icp for up to date information
Conference Sessions Tuesday, June 26

A Project-based Learning Approach in Teaching Simulation to Undergraduate and Graduate Students
Dr. Gokhan Egilmez, University of New Haven
Dr. Dusan Sormaz, Ohio University
Dr. Ridvan Gedik, University of New Haven
Implementation of a Project-based Learning Approach to Undergraduate Education: Case Study of Optimization Course in Industrial Engineering
Dr. Behin Elahi, Purdue University, Fort Wayne
Implementing a Course-based Undergraduate Research Experience (CURE) into an IE Curriculum
Ms. Leslie Potter, Iowa State University
Dr. Richard Stone, Iowa State University
Ms. Audrey Fyock, Iowa State University
Devna Fay Popejoy-Sheriff, Iowa State University
Dr. Janis P. Terpeny, Pennsylvania State University, University Park
Dr. Catherine M. Harmonsoky, Pennsylvania State University, University Park
Prof. Amine Lehtihet, Pennsylvania State University, University Park
Dr. Vittal Prabhu, Pennsylvania State University, University Park
Dr. Andris Freivalds, Pennsylvania State University, University Park
Ms. Elena M. Joshi, Pennsylvania State University, University Park
Prof. Jose A. Ventura, Pennsylvania State University, University Park
Reality Gaps in Industrial Engineering Senior Design or Capstone Projects
Desen Sevi Ozkan, Virginia Tech
Dr. Homero Gregorio Murzi, Virginia Tech
Dr. Alejandro Salado, Virginia Tech
Chris Gewirtz, Virginia Tech

Main Campus, West Lafayette (College of Engineering)
Released in 2008 in the wake of a National Science Foundation-sponsored summit meeting, The Newport Declaration to Globalize U.S. Engineering Education was initially endorsed by 19 signatories and later attracted nearly 50 more signatures of support. The document built a strong case for enhancing the ability of all engineering students to span national and cultural boundaries, in turn calling on educators, administrators, and policymakers to “integrate global education into the engineering curriculum to impact all students.” Since the release of the Newport Declaration, the number of engineering students participating in study, work, and research experiences abroad has continued to inch upward. Yet this movement has also bypassed many schools and waned at others, particularly in the midst of leadership changes and evolving strategic priorities, not to mention significant shifts in the wider geopolitical landscape. This session brings together a distinguished group of panelists to discuss the history, current state, and future of global engineering education. It includes signatories of the Newport Declaration, as well as administrators and leaders from diverse schools and programs. This interactive session will also give participants opportunities to reflect on and share their own successes and challenges.

T433A - Professional Development for Teachers
1:30 p.m. - 3:00 p.m., Room 258, Convention Center - Salt Palace
Sponsor: Pre-College Engineering Education Division
Moderator: Bradley Bowen, Virginia Tech
Teacher professional development includes professional development on engineering design notebooks, entrepreneurship and nano-environmental engineering and the intersection with engineering standards.

Nano-environmental Engineering for Teachers (Work in Progress)
Dr. Carolyn Aitken Nichol, Rice University
Ms. Christina Anlynette Crawford, Rice University
Jorge Loyo-Rosas, Rice University
Alice Chow,
Dr. Carrie Obenland, Rice University
Fundamental: A Teacher Professional Development Program in Engineering Research with Entrepreneurship and Industry Experiences
Mr. Sai Prasanth Krishnamoorthy, New York University
Dr. Sheila Borges Rajguru, New York University
Dr. Vikram Kapila, New York University
Interests and Needs of Secondary Science Educators Regarding Professional Development on Engineering Standards (Fundamental)
Sarah E. Lopez, Utah State University
Dr. Wade H. Goodridge, Utah State University
Prof. Kurt Henry Becker, Utah State University
Teacher Implementation of Structured Engineering Notebooks in Engineering Design-based STEM Integration Units (Fundamental)
Hillery Elizabeth Merzdorf, Purdue University, West Lafayette
Amanda C. Johnston, Purdue University, West Lafayette
Dr. Kerrie A. Douglas, Purdue University, West Lafayette

Schedule subject to change: Please go to www.asee.org/icp for up to date information
**Conference Sessions**

**T433B - Engineering Career Attitudes**
1:30 p.m. - 3:00 p.m., Room 257 B, Convention Center - Salt Palace
**Sponsor:** Pre-College Engineering Education Division
**Moderator:** Stephany Santos, University of Connecticut

Attitudes are discussed with relation to research, a measurement instrument, motivation, and impact.

Assessment of the Impact of Summer STEAM Programs on High School Participants’ Content Knowledge and Attitude Towards STEAM Careers
- Mr. Marcelo Caplan, Columbia College

Promoting the STEM Pipeline and Enhancing STEM Career Awareness Through Participation in Authentic Research Activities (RTP, Diversity)
- Dr. Bugrahan Yalvac, Texas A&M University
- Dr. Oluwatosin A. Bewaji, Texas A&M University
- Ms. Madison Elaine Spier, Texas A&M University
- Mr. Gustavo Mosqueda Elizondo III, Texas A&M University

Student Attitudes Toward STEM: A Revised Instrument of Social Cognitive Career Theory Constructs (Fundamental)
- Dr. Sarah A. Roller, University of Alabama, Huntsville
- Dr. Sandra A. Lampley, University of Alabama, Huntsville
- Dr. Monica Lettere Dillihunt, University of Alabama, Huntsville
- Dr. Michael P.J. Benfield, University of Alabama, Huntsville
- Dr. Matthew William Turner, University of Alabama, Huntsville

The Influence of Early STEM Career Exploration as Related to Motivation and Self-determination Theory
- Dr. Araceli Martinez Ortiz, Texas State University
- Dr. Hiroko Kawaguchi Warshauer, Texas State University
- Mrs. Sara Garcia Torres M.Ed., Texas State University
- Dr. Laura Rodríguez Araya,

(Fundamental) Fregados Pero no Jodidos: A Case Study of Latinx Rasquachisimo
- Dr. Joel Alejandro Mejía, University of San Diego
- Prof. Alberto López Pulido, University of San Diego

**T434 - Imagining and Reimagining Engineering Education as a Dynamic System**
1:30 p.m. - 3:00 p.m., Room 255 C, Convention Center - Salt Palace
**Sponsor:** Liberal Education/Engineering & Society Division
**Moderator:** Dean Nieusma, Rensselaer Polytechnic Institute

The Distributed System of Governance in Engineering Education: A Report on Initial Findings
- Dr. Atsushi Akera, Rensselaer Polytechnic Institute
- Dr. Donna M. Riley, Purdue University, West Lafayette
- Dr. Alan Cheville, Bucknell University
- Dr. Jennifer Karlin, Minnesota State University, Mankato

Building Your Change-agent Toolkit: The Power of Story
- Dr. Jennifer Karlin, Minnesota State University, Mankato
- Dr. Abeera P. Rehman, Purdue University, West Lafayette
- Dr. Marissa Christina Owens, University of Nevada, Las Vegas

**T433C - PCEE Resource Exchange**
1:30 p.m. - 3:00 p.m., Room 257 A, Convention Center - Salt Palace
**Sponsor:** Pre-College Engineering Education Division
**Moderator:** Martha Cyr, Worcester Polytechnic Institute

This session provides a forum for sharing curriculum materials.

Learning Advanced Mathematics Through Engineering Design (Resource Exchange)
- Mr. Euisuk Sung, Purdue University, West Lafayette

**Tuesday, June 26**

Dr. Scott R. Bartholomew, Purdue Polytechnic Institute
Dr. Greg J. Strimel, Purdue Polytechnic Institute

Make-an-Engineer Introduction to Engineering Activity (P12 Resource/Curriculum Exchange)
Dr. Morgan M. Hynes, Purdue University, West Lafayette
Ms. Chanel Beebe, Purdue University, West Lafayette
Miss Avneet Hira, Purdue University, West Lafayette
Mrs. Kayla R. Maxey, Purdue University, West Lafayette

Model-Eliciting Activities to Develop Problem-scoping Skills at Different Levels (Resource Exchange)
Mr. Aran W. Glancy, Purdue University, West Lafayette
Prof. Tamara J. Moore, Purdue University, West Lafayette

Neural Engineering for Secondary Science Classrooms (Resource Exchange)
Ms. Kristen Clapper Bergsman, University of Washington
Dr. Eric H. Chudler, University of Washington

Polymers in the Classroom: Developing a Summer Workshop for High School Science Teachers (Resource Exchange)
Ms. Alex Vincent Janini, Syracuse University
Ms. Shelby Buffington, Syracuse University
Dr. James H. Henderson, Syracuse University
Sally B. Mitchell, Rye High School, New York

There's No Place Like Home: Designing Tornado-proof Structures (Resource Exchange)
Dr. Aberea P. Rehmat, Purdue University, West Lafayette
Dr. Marissa Christina Owens, University of Nevada, Las Vegas

**T434C - PCEE Resource Exchange**
1:30 p.m. - 3:00 p.m., Room 257 A, Convention Center - Salt Palace
**Sponsor:** Pre-College Engineering Education Division
**Moderator:** Martha Cyr, Worcester Polytechnic Institute

Learning Advanced Mathematics Through Engineering Design (Resource Exchange)
- Mr. Euisuk Sung, Purdue University, West Lafayette

Schedule subject to change: Please go to [www.assee.org/icp](http://www.assee.org/icp) for up to date information
Conference Sessions

Tuesday, June 26

Prof. Derek T. Reamon, University of Colorado, Boulder
Dr. Kenneth M. Anderson, University of Colorado, Boulder

T435A - Strategies for Effective Education in Manufacturing
1:30 p.m. - 3:00 p.m., Room 260 B, Convention Center - Salt Palace
Sponsor: Manufacturing Division
Moderators: Hugh Jack, Western Carolina University; Aditya Akundi, University of Texas, El Paso
Strategies for Effective Education in Manufacturing

T435B - Integrating Additive Manufacturing Practices in Education
1:30 p.m. - 3:00 p.m., Room 253 B, Convention Center - Salt Palace
Sponsor: Manufacturing Division
Moderators: Ismail Fidan, Tennessee Technological University; Vukica Jovanovic, Old Dominion University
Integrating Additive Manufacturing Practices in Education

T436 - Materials Division Business Meeting
1:30 p.m. - 3:00 p.m., Room 250 C, Convention Center - Salt Palace
Sponsor: Materials Division

T438 - Mechanical Engineering Division
Technical Session 5
1:30 p.m. - 3:00 p.m., Room 255 B, Convention Center - Salt Palace
Sponsor: Mechanical Engineering Division
Moderator: James Hylton, Ohio Northern University
Combining Course Flipping and a Low-Cost Experiment to Teach Frequency Response
Dr. Ryan W Krauss, Grand Valley State University
Increased Student Engagement in Problem Solving Courses in Engineering through Active Learning
Dr. Puttagounder Dhanasekaran Swaminathan, University of Minnesota, Duluth
Dr. Ping Zhao, University of Minnesota Duluth
Using Distinctive Student Engagement Elements in a Technical Elective Course
Dr. Rambod Rayegan, Prairie View A&M University
An Initial Exploration of Engineering Students’ Emotive Responses to Spatial and Engineering Statics Problems
Dr. Idalis Villanueva, Utah State University
Dr. Wade H. Goodridge, Utah State University
Mr. Benjamin James Call, Utah State University - Engineering Education
What Can DISC and Motivation Profiles Disclose About Student Retention in Engineering?
Dr. Breigh Nonte Roszelle, University of Denver
Ms. Karen Kaye Langenberg, Indigo Education Company
Dr. Jason Andrew Roney, University of Denver
Dr. Matt Gordon P.E., University of Denver
Take Flight Robotics: A STEM Education Workshop for High School Students
Miss Elyse Hill, University of Guelph
Mr. Andrew Lee, University of Guelph
Ms. Amy Domenique Gadsden, University of Alberta
Dr. Stephen Andrew Gadsden, University of Guelph
Dr. Stephen Andrew Wilkerson P.E., York College of Pennsylvania
Work in Progress: Sustainable Engineering Education in the Mechanical Engineering Curriculum
Dr. Huibui Qi, Grand Valley State University
Implementation and Assessment of a Remotely Accessible Laboratory in an Engineering Dynamic Systems Course
Dr. Nolan Tsuchiya P.E., California State Polytechnic University, Pomona
Dr. Zhaoshuo Jiang P.E., San Francisco State University
Mr. Alec William Maxwell, San Francisco State University
Prof. Zahira H. Merchant,
Tuesday, June 26

Conference Sessions

T440 - Minorities in Engineering Division Technical Session 5
1:30 p.m. - 3:00 p.m., Room 155 E, Convention Center - Salt Palace
Sponsor: Minorities in Engineering Division
Moderators: Leroy Long, Embry-Riddle Aeronautical Univ., Daytona Beach; Cynthia Hampton, Virginia Tech
Culture and experiences.

Developing Communities of Practice to Serve Hispanic Students:
Supporting Identity, Community, and Professional Networks
Dr. Sarah Hug, Colorado Evaluation & Research Consulting

Community: Voices from a Small Cohort
Miss Monica Lauren Singer, AmeriCorps VISTA
Dr. Lizabeth T. Schlemer, California Polytechnic State University, San Luis Obispo
Ms. Emily E. Liptow, California Polytechnic State University, San Luis Obispo
Prof. Roberta J. Herter, California Polytechnic State University, San Luis Obispo
Dr. Katherine Chen, Worcester Polytechnic Institute
Reflections on a new community partnership: How does an engineering summer camp evolve to meet the needs of an increasingly diverse student population? (WIP)
Emily E. Liptow, California Polytechnic State University, San Luis Obispo
Dr. Katherine Chen, Worcester Polytechnic Institute
Berizohar Padilla Cerezo, Maria Manzano, California Polytechnic State University, San Luis Obispo

Engineering Connections in a Native American Community and Culture
Ieshya Anderson, Arizona State University
Dr. Shawn J. Jordan, Arizona State University
Preliminary Insights from Exploring Engineering Learning
Ecosystems of Black Youth
Nina McDaniel, University of Michigan, Dearborn
DeLean Tolbert, University of Michigan, Dearborn

T441 - Engineering and Computer Science Undergraduate Education in 2026 and Beyond: NSF Interactive Session
1:30 p.m. - 3:00 p.m., Room 155 A, Convention Center - Salt Palace
Sponsor: Multidisciplinary Engineering Division
Moderator: Amir Karimi, University of Texas, San Antonio
Speakers: Dr. Alexandra Medina-Borja, National Science Foundation; Prof. Stephanie Elizabeth August, Loyola Marymount University
By 2026, today’s fifth graders will be entering college, and the first-year students of today will be the assistant professors of 2026. The workforce will see (re)volutionary changes in the workplace at the human—technology frontier. It is time to reflect on the future and think strategically about how we will reach the future we want to live.

The development and maturation of content delivery mechanisms and active learning/project-based experiences for undergraduate students has increased dramatically in recent years. The Division of Undergraduate Education of the National Science Foundation is preparing to have this nationwide dialogue and wants to have these conversations with different STEM communities and industry around the country. Questions such as: How can we leverage what we already know, working to improve and broaden undergraduate STEM education—and engineering and computer science education in particular? How do we prepare students to solve the wicked societal problems of the future? Will they require problem-solving skills that transcend disciplines? Is interdisciplinarity teachable at the undergraduate Engineering and Computer science level?

Considering where technology is going, what are the skills that employers will require in 10 and 20 years? What kinds of jobs will Engineering graduates be offered in 2026? Would this future be different for different engineering disciplines? What are the skills/knowledge graduate schools will require?
What will students look like in 2026 (demographically, culturally, cognitively, etc.)?
What do we hope undergraduate engineering education will look like in 2026? 2050? How will we get there? What support is needed to ensure that we achieve this vision?

This session reflects on our pathway to undergraduate engineering education of the future.

T441B - Multidisciplinary Engineering Programs
1:30 p.m. - 3:00 p.m., Room 151 B, Convention Center - Salt Palace
Sponsor: Multidisciplinary Engineering Division
Moderators: Cheng Zhu, Rowan University; Afsaneh Minaie, Utah Valley University
Social Network Analysis: Peer Support and Peer Management in Multidisciplinary, Vertically Integrated Teams
J. Sonnenberg-Klein, Georgia Institute of Technology
Dr. Randal T. Abler, Georgia Institute of Technology
Prof. Edward J. Coyle, Georgia Institute of Technology
Correlation Between Academic Credit-use Policies and Student Persistence in Multidisciplinary Vertically Integrated Project (VIP) Courses
J. Sonnenberg-Klein, Georgia Institute of Technology
Prof. Edward J. Coyle, Georgia Institute of Technology
Dr. Randal T. Abler, Georgia Institute of Technology
Growing Entrepreneurial Mindset in Interdisciplinary Student Engineers: Experiences of a Project-Based Engineering Program
Dr. Elizabeth Pluskwik, Minnesota State University, Mankato
Dr. Eleanor Leung, Minnesota State University, Mankato
Mr. Andrew Lillesve, IRE
Nanotechnology Fellows Program: Integrating Interdisciplinary Education, Professional Development, and Outreach
Prof. Saniya LeBlanc, George Washington University
Dr. Ekundayo Shittu, George Washington University
Work in Progress: Co-curricular and Extra-curricular Experiences
of NSF-supported Scholars  
Prof. Huihui Wang, Jacksonville University  
Dr. Lee Ann Jerome Clements, Jacksonville University  
Cindy Leong,  
Misha M Chalkley,  
Mr. Crandall Maines, Jacksonville University Engineering

Conference Sessions Tuesday, June 26

T445 - Executive Board Meeting  
1:30 p.m. - 3:00 p.m., Room 250 E, Convention Center - Salt Palace  
Sponsor: Engineering Physics and Physics Division

T447 - Student Pathways into Engineering Education  
1:30 p.m. - 3:00 p.m., Room 355 F, Convention Center - Salt Palace  
Sponsor: Student Division  
Speakers: Ms. Amy L Hermundstad, Virginia Tech; Mr. Hector Enrique Rodriguez-Simmonds, Purdue Engineering Education;  
Mrs. Marissa A Tsugawa-Nieves, University of Nevada, Reno  
This panel session is targeted at graduate and undergraduate students curious about pursuing an engineering education Ph.D. program, and may be of interest to current Ph.D. students and faculty mentors as well. We will have graduate student panelists representing different options for Ph.D. study of engineering education, including: established engineering education research institutions, schools of engineering that allow education dissertations, and schools of education that incorporate research in engineering education. It will also include a faculty member in engineering education who can comment more holistically on the process. The speakers will discuss how they chose where to study, the diversity among their experiences and requirements, the particular struggles and advantages of their paths, and where they see their career trajectories after completing their Ph.D.s. This interactive panel will be moderated by a current engineering education student who can field target questions of interest to the student audience.

T448 - Investigating Approaches to Advance Knowledge and Maturity in Systems Engineering (Part I)  
1:30 p.m. - 3:00 p.m., Room 151 G, Convention Center - Salt Palace  
Sponsor: Systems Engineering Division  
Moderator: Alice Squires, International Council on Systems Engineering  
Speakers: Dr. Jon Wade, Stevens Institute of Technology (School of Systems & Enterprises); Dr. Radu F. Babiceanu, Embry-Riddle Aeronautical Univ., Daytona Beach; Tom McDermott, Georgia Institute of Technology; Dr. Alejandro Salado, Virginia Tech  
Historically, competency in systems engineering concepts and approaches was developed over an engineer’s career as one transitioned from a specialty domain of engineering, such as mechanical, electrical, or aerospace, to higher-level technical roles, mainly those related to technical management. The transition took place after an engineer had accumulated decades of experience. Today, however, system complexity drives the need for engineers to understand the role and relationship of their engineering domains within a larger context and across multiple engineering and non-engineering disciplines. Furthermore, systems engineering (SE) has become a standalone engineering domain, with competences, tools, and methods that are unique to it. To support this trend, academia and industry have collaboratively developed approaches for advancing and maturing systems engineering knowledge, skills, and abilities early in the engineer’s education and career. This panel will discuss various approaches in use, their impact on engineering competency development and complex system design, and plans for the future.  
Topics will include:  
- SE knowledge and maturity levels for various applications  
- Fostering discipline appreciation and awareness at various levels of an engineer’s development  
- Problem-based analysis of student challenges that demonstrate a lack of systems engineering skills during coursework, internships and first jobs after graduation  
- Relationships between systems engineering and systems thinking to improve the maturing of SE practitioners  
- Models to transfer knowledge across engineering domains  
- Building systems thinking skills in K-12 education using interactive gaming technology  
- Real-world examples of adapting traditional courses to embed a systems engineering mindset  
This session is the first of two aiming to stimulate the discussion of systems engineering in engineering programs. The follow-on panel will be held on Wednesday from 1:30-3:00 PM.

T450 - TYCD Annual Bussines  
1:30 p.m. - 3:00 p.m., Room 251 A, Convention Center - Salt Palace  
Sponsor: Two-Year College Division  
Annual business meeting. Annual reports from the division chair, program chair, division treasurer, and division secretary. Other topics to be discussed are the Two-year College Division 2019 engineering design competition and possible topics for the 2019 ASEE annual conference sessions.

T451A - History of the Women in Engineering Division: Reflections from Past Chairs of the Division  
1:30 p.m. - 3:00 p.m., Room 254 C, Convention Center - Salt Palace  
Sponsor: Women in Engineering Division  
Moderator: Beena Sukumaran, Rowan University  
Speakers: Prof. Beena Sukumaran, Rowan University; Dr. Janet Callahan, Boise State University; Dr. Donna C. Llewellyn, Boise State University; Dr. Noel N. Schulz, Washington State University; Dr. Sarah A Rajala, Iowa State University; Dr. Beth M Holloway, Purdue University-Main Campus, West Lafayette (College of Engineering)  
In celebration of 125 years of the American Society of Engineering Education, past Chairs of the Women in Engineering Division, Beth Holloway, Donna Llewellyn, Sarah Rajala and Noel Schulz will convene in a focused panel that looks back through the division’s history. Guiding questions will include:  
- Lessons learned for women faculty over the years, including recruitment, retention and advancement.

Schedule subject to change: Please go to www.asee.org/icp for up to date information
• Lessons learned for women students over the years, including recruitment and retention.
• Leveraging ASEE and WIED for advancing one’s career and how WIED affected their individual career progression.
• Their perspective on how the climate for women in engineering has changed over the years.
• Changes in the focus of the Division and ASEE over the years.
• What were the main issues that the division faced during their terms as Chairs of WIED?
• What are some of the research questions we should be asking to better understand what really works in the recruitment and retention of women students, women faculty, and development of women leaders in academia?

Panel discussion on the History of the Women in Engineering Division: Reflections from Past Chairs of the Division
Dr. Beena Sukumaran, Rowan University
Dr. Janet Callahan, Boise State University
Dr. Donna C. Llewellyn, Boise State University
Dr. Beth M Holloway, Purdue University, West Lafayette (College of Engineering)
Dr. Noel N. Schulz, Washington State University
Dr. Sarah A Rajala, Iowa State University
Dr. Donna Reese, Mississippi State University

T451B - Women in Engineering Technical Session
1:30 p.m. - 3:00 p.m., Salon E, HQ Hotel - Marriott at City Creek
Sponsor: Women in Engineering Division

Improving Middle-School Girls’ Knowledge, Self-Efficacy, and Interests in ‘Sustainable Construction Engineering’ through a STEAM ACTIVATED! program
Dr. Andrea Nana Ofori-Boadu, North Carolina A&T State University
Impact of “Imagineer Day”, an Outreach Program, on K-8 girls and Women in Engineering
Dr. Hadil Mustafa, California State University, Chico
Shelby Ann Freese,

Inspiring girls to pursue STEM (ages three to thirteen): a recipe for a successful outreach event
Dr. Jodi Prosise, St. Ambrose University
Dr. R R Romatoski, Saint Ambrose University
Dr. Susa H Stonealahl, St. Ambrose University
Dr. Yunye Shi Shi, St. Ambrose University

Intervention designed to increase interest in engineering for low-interest, K-12 girls did so for boys and girls
Samuel Alberto Acuña, University of Wisconsin - Madison
Mr. Joseph E Michaelis, University of Wisconsin - Madison
Dr. Joshua Daniel Roth, University of Wisconsin-Madison
Dr. Joseph Towles, University of Wisconsin, Madison

Monitoring Motivation Factors for Girls in Summer Robotics Program
Dr. Michele Miller, Campbell University
Ms. Saeedeh Ziaeefard, Michigan Technological University
Mr. Brian R Page, Michigan Technological University

Tuesday, June 26

T452 - Community Engagement Division - Business Meeting
1:30 p.m. - 3:00 p.m., Room 251 B, Convention Center - Salt Palace
Sponsor: Community Engagement Division

The Community Engagement Division welcomes experienced and new members alike to the annual business meeting. This is a great opportunity to learn how you can contribute to the service-oriented activities of this division.

T455 - Addressing the Leadership Requirement in New ABET Criteria
1:30 p.m. - 3:00 p.m., Room 259, Convention Center - Salt Palace
Sponsors: Engineering Leadership Development Division; Engineering Management Division

Moderator: Ronald Bennett, University of St. Thomas
Speakers: Dr. William J. Schell IV P.E., Montana State University; Dr. Meagan R. Kendall, University of Texas, El Paso; Dr. David Bayless P.E., Ohio University; Mr. Andrew Michael Erdman, Pennsylvania State University, University Park; Dr. James Warnock, University of Georgia; Dr. Elliot P. Douglas, University of Florida

The Accrediting Board for Engineering and Technology (ABET) has revised Criterion 3 – Student Outcomes, and Criterion 5 – Curriculum. These changes will be in effect for all engineering programs having visits in fall 2019. New to Criterion 3 is the inclusion of leadership. If you have an interest in how to prepare for assessment of leadership in your engineering programs, attend this panel of experienced faculty whose programs offer engineering leadership development. Learn what they are doing, and what they and the LEAD division can do to help you prepare.

T480 - Research in Faculty Development
1:30 p.m. - 3:00 p.m., Room 151 E, Convention Center - Salt Palace
Sponsor: Faculty Development Constituency Committee
Moderator: Karen High, Clemson University

Join presenters in this session to discuss research around faculty and faculty development.

Lauren Nicole Knop, Michigan Technological University
Mr. Guilherme Aramizo Ribeiro, Michigan Technological University
Dr. Mo Rastgar,
Dr. Nina Mahmoudian, Michigan Technological University

Moving Toward Student-centered Learning: Motivation and the Nature of Teaching Changes Among Faculty in an Ongoing Teaching Development Group
Prof. Jill K. Nelson, George Mason University
Dr. Margret Hjalmarson, George Mason University

Forming Strategic Partnerships: New Results from the Revolutionizing Engineering and Computer Science Departments Participatory Action Research
Dr. Cara Margherio, University of Washington
Kerice Doten-Snitzer, University of Washington

Schedule subject to change: Please go to www.asee.org/icp for up to date information
Schedule subject to change: Please go to www.asee.org/icp for up to date information.

**T496A - LGBTQIA+ Leadership Roundtable**
1:30 p.m. - 3:00 p.m., Salon A, HQ Hotel - Marriott at City Creek
Sponsors: ASEE Headquarters; Biomedical Engineering Division; Engineering Technology Division; Multidisciplinary Engineering Division
Moderators: Kelly Cross, University of Illinois, Urbana-Champaign; Chris Carr; Anthony Butterfield, University of Utah

LGBTQIA+ Leadership Roundtable: As part of ASEE’s ongoing activities in support of a diverse and inclusive environment for all members, this is a working session for a special interest group (SIG) focusing on issues relevant to the LGBTQIA+ community. The purpose is to facilitate open dialogue and conversation, allowing participants to discuss how ASEE can support engineering education, relevant diversity research, and engagement of this community in society activities. A team of facilitators will help guide the discussion, and the output of the session will be a set of recommendations for consideration by ASEE's leadership for consideration and integration into the activities of the society.

**T496B - 1st Generation/SES Leadership Roundtable**
1:30 p.m. - 3:00 p.m., Salon B, HQ Hotel - Marriott at City Creek
Sponsors: ASEE Headquarters; Biomedical Engineering Division; Engineering Technology Division; Multidisciplinary Engineering Division; Biological and Agricultural Engineering Division
Moderated by:
Dina Verdin, Purdue University
Juan Lucena, Colorado School of Mines
Jessica Smith, Colorado School of Mines

As part of ASEE’s ongoing activities in support of a diverse and inclusive environment for all members, this is a working session for a special interest group (SIG) focusing on issues relevant to the community of first-generation and low socioeconomic status students. The purpose is to facilitate open dialogue and conversation, allowing participants to discuss how ASEE can support engineering education, relevant diversity research, and engagement of this community in society activities. A team of facilitators will help guide the discussion, and the output of the session will be a set of recommendations for consideration by ASEE's leadership for consideration and integration into the activities of the society.

**T496C - Persons with Disabilities Leadership Roundtable**
1:30 p.m. - 3:00 p.m., Salon C, HQ Hotel - Marriott at City Creek
Sponsors: ASEE Headquarters; Cooperative and Experiential Education Division; Biomedical Engineering Division; Engineering Technology Division; Multidisciplinary Engineering Division
Moderated by:
Yvette Pearson, Rice University 
Canek Phillips, Rice University

As part of ASEE’s ongoing activities in support of a diverse and inclusive environment for all members, this is a working session for a special interest group (SIG) focusing on issues relevant to the community of students and faculty with disabilities. The purpose is to facilitate open dialogue and conversation, allowing participants to discuss how ASEE can support engineering education, relevant diversity research, and engagement of this community in society activities. A team of facilitators will help guide the discussion, and the output of the session will be a set of recommendations to ASEE's leadership for consideration and integration into the activities of the society.

**T496D - Military Veterans Leadership Roundtable**
1:30 p.m. - 3:00 p.m., Salon D, HQ Hotel - Marriott at City Creek
Sponsors: ASEE Headquarters; Biomedical Engineering Division; Engineering Technology Division; Multidisciplinary Engineering Division
Moderators: Bobby Crawford, Quinnipiac University; Brian Novoselich, U.S. Military Academy

As part of ASEE’s ongoing activities in support of a diverse and inclusive environment for all members, this is a working session for a special interest group (SIG) focusing on issues relevant to the military veteran community. The purpose is to facilitate open dialogue and conversation, allowing participants to discuss how ASEE can support engineering education, relevant diversity research, and engagement of this community in society activities. A team of facilitators will help guide the discussion, and the output of the session will be a set of recommendations for consideration by ASEE's leadership for consideration and integration into the activities of the society.

**T496E - Advances in Engineering Education**
1:30 p.m. - 3:00 p.m., Room 251 F, Convention Center - Salt Palace
Sponsor: ASEE Headquarters

Advances in Engineering Education

**T496F - GATE Faculty Development**
1:00 p.m. - 4:30 p.m., Salon J, HQ Hotel - Marriott at City Creek
Sponsor: ASEE Headquarters

GATE faculty development.
## Conference Sessions

### T499 - Campus Rep Business Meeting
1:30 p.m. - 3:00 p.m., Room 251 D, Convention Center - Salt Palace  
**Sponsor:** Campus Representatives  
Annual business meeting of ASEE's campus representatives. Free ticketed event

### T504 - Biomedical Engineering Division Business Meeting
3:15 p.m. - 4:45 p.m., Salon E, HQ Hotel - Marriott at City Creek  
**Sponsor:** Biomedical Engineering Division  
We will discuss the content of the current and future annual meetings, elect officers, and discuss other matters of importance to the biomedical engineering community. This meeting is open to all BED members.

### T505 - Chemical Engineering Division Open Mic
3:15 p.m. - 4:45 p.m., Room 355 C, Convention Center - Salt Palace  
**Sponsor:** Chemical Engineering Division  
This "Open Mic" session is a free forum on chemical engineering education. This informal session is open to a general audience and will be a free exchange of ideas, opportunities, and challenges within chemical engineering education.

### T506 - Educational & Professional Issues of Strategic Importance to the Civil Engineering Profession and ASCE II
3:15 p.m. - 4:45 p.m., Room 255 C, Convention Center - Salt Palace  
**Sponsor:** Civil Engineering Division  
**Moderators:** Thomas Lenox, American Society of Civil Engineers; James O’Brien, American Society of Civil Engineers  
- Dr. Decker B. Hains, Western Michigan University  
- Dr. Kenneth J. Fridley, University of Alabama  
- Ms. Leslie Nolen CAE, American Society of Civil Engineers  
- Dr. Brock E. Barry P.E., United States Military Academy  
- Raising the Civil Engineering Body of Knowledge (BOK): The Application of the Cognitive Domain of Bloom’s Taxonomy  
- Assessing the Civil Engineering Body of Knowledge in the Affective Domain  
- The Practitioners’ Point of View of the ASCE Body of Knowledge  
- The Civil Engineering Body of Knowledge: Supporting ASCE’s Grand Challenge  

### T507 - College Industry Partnerships Division Technical Session 2
3:15 p.m. - 4:45 p.m., Room 253 B, Convention Center - Salt Palace  
**Sponsor:** College Industry Partnerships Division  
- An Example from Construction Safety: Professional Certifications as Potential Drivers of Degree Program Enhancements  
- Development of a Multi-skilled Craftsman Program Through Collaboration Between Industry, Technical Community College, and Four-year University  
- Industry-based Case Studies for an Online Graduate Certificate Wind Energy Program  
- Three Examples of a New Industry-authored Flexible Plan B.S. Degree

### T508 - COED: IOT and Cybersecurity
3:15 p.m. - 4:45 p.m., Room 355 B, Convention Center - Salt Palace  
**Sponsor:** Computers in Education Division  
**Moderator:** Ahmed Khan, DeVry University, Addison  
This session focuses on COED submitted papers which are related to IOT and cybersecurity.  
- Using the Internet of Things (IoT) to Motivate Engineering Technology and Management (ETM) Students  
- Effectiveness of Current-generation Virtual Reality-based Laboratories  
- Single-board Computer Used for Network Streaming Audio Player
TFT Touchscreen-based Application
Dr. David Border, Bowling Green State University

T509 - Panel Session: Construction Apps for Education
3:15 p.m. - 4:45 p.m., Room 255 E, Convention Center - Salt Palace
Sponsor: Construction Engineering Division
Moderators: James Otter, Pittsburg State University; Norman Philipp, Pittsburg State University
Speaker: Prof. James L. Otter, Pittsburg State University

T510 - Supporting Faculty in Course Development and Pedagogy
3:15 p.m. - 4:45 p.m., Room 254 A, Convention Center - Salt Palace
Sponsor: Continuing Professional Development Division
Moderator: Tamra Swann, Mississippi State University
Faculty development has become an important issue in implementation of effective classroom pedagogy and online course delivery in engineering education. This session will explore faculty development programs designed to facilitate incorporation of research-based pedagogy into both online and classroom based engineering courses.

Using a Collaborative Design Model for Developing Quality Online Courses
Caitlin A. Keller, Worcester Polytechnic Institute

Is There a Connection Between Classroom Practices and Attitudes Towards Student-Centered Learning in Engineering?
Lydia Ross, Arizona State University
Dr. Eugene Judson, Arizona State University
Dr. Casey Jane Ankeny, Northwestern University
Prof. Stephen J. Krause, Arizona State University
Prof. Robert J. Culbertson, Arizona State University
Dr. Keith D. Hjelmstad, Arizona State University
Mrs. Lindy Hamilton Mayled, Arizona State University
Mrs. Kristi Glassmeyer, Arizona State University
Prof. James A. Middleton, Arizona State University
Kara L. Hjelmstad, Arizona State University

Facilitating Change in Instructional Practice in a Faculty Development Program through Classroom Observations and Formative Feedback Coaching
Kara L. Hjelmstad, Arizona State University
Dr. Keith D. Hjelmstad, Arizona State University
Prof. Stephen J. Krause, Arizona State University
Mrs. Lindy Hamilton Mayled, Arizona State University
Dr. Eugene Judson, Arizona State University
Lydia Ross, Arizona State University
Prof. Robert J. Culbertson, Arizona State University
Prof. James A Middleton, Arizona State University
Dr. Casey Jane Ankeny, Northwestern University
Dr. Ying-Chih Chen, Arizona State University
Assessing Faculty and Organizational Change in a Professional Development Program with Workshops and Disciplinary Communities of Practice
Prof. Stephen J. Krause, Arizona State University
Dr. Keith D. Hjelmstad, Arizona State University

T5100A - INDUSTRY DAY: The Twists and Turns of an Engineer’s Career
3:15 p.m. - 4:45 p.m., Room 151 D, Convention Center - Salt Palace
Sponsor: Corporate Member Council
Moderator: Cynthia Murphy, Chevron Corporation

The Impact of Free Lunch on Attendance at Voluntary Teacher Training
Dr. Todd Easton, Kansas State University

T5101 - Best Zone Papers Session
3:15 p.m. - 4:45 p.m., Room 355 A, Convention Center - Salt Palace
Sponsor: Council of Sections
Best Zone Papers session featuring:
Zone I: Assessment of Progressive Learning of Ethics in Engineering Students Based on the Model of Domain Learning
Authors: Dr. Ivan E. Esparragoza (Pennsylvania State University, University Park), Dr. Sadan Kulturel-Konak (Pennsylvania State University, University Park), Dr. Abdullah Konak (Pennsylvania State University, University Park), Dr. Gül E. Kremer (Iowa State University), Dr. Kristen A. Lee (Menlo College)

Zone II: Comparison of Student and Faculty Perceptions of Intent and Effectiveness of Course Evaluations in an Engineering Curriculum
Authors: John Michael Van Teeck (Rose-Hulman Institute of Technology), Thomas P. James (Rose-Hulman Institute of Technology)
Zone III: Using the SCALE-UP Method to Create an Engaging First-Year Engineering Course (extended abstract)
Authors: David J. Ewing (The University of Texas at Arlington)
Zone IV: Strengthening Community College Engineering Programs Through Alternative Learning Strategies Developing an Online Engineering Graphics Course
Authors: Amelito Enriquez (Canada College), Erik Dunmire (College of Marin), Thomas Rebol (Monterey Peninsula College), Nicholas Langhoff (Skyline College), Tracy Huang (Canada College)

T5109A - Sponsor Technical Session: Design Your 'Ideal—Presented by McGraw-Hill Higher
Education
3:15 p.m. - 4:45 p.m., Room 150 C - Sponsor Tech Room, Convention Center - Salt Palace
Sponsor: Sponsored Sessions
Every person defines their ideal teaching experience differently. What matters to you? Course Setup? Student engagement? Personalized learning? Outcomes? Or, something else? Hear from educators and students who are working towards their ideal experience using McGraw-Hill's Connect® to unlock their full potential.

T5109B - Sponsor Technical Session: Classroom-ready Engineering Projects with MATLAB, Simulink, and IoT - Presented by Mathworks
3:15 p.m. - 4:45 p.m., Room 150 A - Sponsor Tech Room, Convention Center - Salt Palace
Sponsor: Sponsored Sessions
Do you want to introduce industry trends such as Internet of Things (IoT) and deep learning as part of your curriculum? Would you like to add engaging projects to your classroom without intimidating students?

In this session, we will cover how MATLAB and Simulink can be integrated with hardware such as Arduino, Raspberry Pi, and mobile devices to solve real-world problems. We will also highlight new prebuilt projects and modules that you could incorporate into your curriculum right away.

Highlights include:
• Arduino Engineering Kit: Self-balancing motorcycle, drawing robot, mobile rover
• Internet of Things: Traffic monitoring system
• Mobile Devices: Step counter
• Deep Learning: Automatic object recognition in webcam video feed

T5109C - Sponsor Technical Session: Presented by Texas A&M Engineering
3:15 p.m. - 4:45 p.m., Room 150 B - Sponsor Tech Room, Convention Center - Salt Palace
Sponsor: Sponsored Sessions
A panel of experts from four different institutions will discuss their best practices in terms of engineering education and what each of them are doing in order to stand out in a growing field. Hosted by the College of Engineering at Texas A&M.

Moderator: Dr. Mark Weichold, Senior Associate Dean for Academic Affairs – College of Engineering
BIO: Dr. Mark Weichold began his role leading Engineering Academic and Student Affairs last summer, and he said he’s enjoying the opportunity to make an impact on student success.

“When we admit students to the Texas A&M engineering program, it is a very careful process,” he said. “Through our holistic review process we’re looking at more than just a student’s grades. We’re looking at the whole student including their extracurricular activities, leadership, STEM engagement, and life circumstances, among other factors.”

Weichold’s goal is to have a first- to second-year retention rate of 90 percent or more. To achieve this, he’s taking a close look at the many factors that affect students in the first year and how the college helps undergraduate students who are experiencing challenges succeed.

“The benefit will be an engineering student body that is much richer,” he said. “When you have students sitting at a design table from different backgrounds and with different skills, the end result will ultimately be a better design.”

T5112A - Action on Diversity - Safe Zone Ally Training (Level 2)
3:15 p.m. - 4:45 p.m., Room 150 E, Convention Center - Salt Palace
Sponsors: ASEE Diversity Committee; Minorities in Engineering Division; International Division
Moderator: Rocio Chavela Guerra, American Society for Engineering Education
Speakers: Dr. Rocio C. Chavela Guerra, American Society for Engineering Education; Dr. Joel Alejandro Mejia, University of San Diego; Mr. Tiago R. Forin, Rowan University
Tickets are requested for planning purposes only! Please come even if you do not sign up in advance.

Did you know…
- 1 in 5 LGBTQIA+ students fears for their physical safety on college campuses?
- 1 in 3 LGBTQIA+ students is made to feel uncomfortable in our classrooms?
- LGBTQIA+ engineering students are more likely than women, underrepresented minorities, and non-LGBTQ peers to report a chilly climate
- STEM departments are lagging way behind other disciplines in the adoption of LGBTQIA+-inclusive practices.

You can help change this! Safe Zone Ally Training is a series of interactive workshops for students, faculty and the professional community, during which participants will build the knowledge and skills needed to create a more inclusive and affirming environment for LGBTQIA+ individuals in engineering. The workshops have been developed by a community of Science and Engineering professionals and students, specifically for a STEM audience.

Safe Zone Level 1 focuses on understanding LGBTQIA+ concepts and the coming out process, responding to bias, and adopting simple strategies for building an inclusive environment.

Safe Zone Level 2 discusses aspects of engineering culture that act as barriers to LGBTQIA+ equality and explore heterosexual and cisgender privilege. Participants learn to recognize bias and disrupt discrimination.

The Deep Dive LGBTQIA+ Inclusion workshop focuses on creating a supportive and inclusive environment for transgender students and colleagues.

Participants in Levels 1 and 2 will receive a Safe Zone sticker to display in their workplace. Digital badges will be awarded for participation in each workshop in the Safe Zone series.

Free ticketed event

T5116A - ABET SESSION: What’s new at ABET 2018?
3:15 p.m. - 4:45 p.m., Room 150 D, Convention Center - Salt Palace
Sponsor: ABET Sponsored Sessions
This ABET-sponsored program will share current activities and news
with engineering educators. ABET representatives will unfold findings from the Diversity and Inclusion Committee, as well as topics that are on the strategy horizon for ABET.

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**T514A - Progress of the Revolution: NSF RED Projects Overview**

3:15 p.m. - 4:45 p.m., Salon D, HQ Hotel - Marriott at City Creek  
Sponsor: Educational Research and Methods Division  
Speakers: Dr. Susan M Lord, University of San Diego; Prof. Joseph M LeDoux, Georgia Institute of Technology; Dr. Jeremi S London, Arizona State University; Prof. Thomas Martin, Virginia Tech; Dr. Noah Salzman, Boise State University; Prof. James D. Sweeney, Oregon State University; Prof. Beena Sukumaran, Rowan University

This session aims to provide a forum for the engineering education community to conduct a dialogue with REvolutionizing engineering and computer science Departments (RED) project team members and to showcase the diversity of current projects in this National Science Foundation-funded program.

**Learning Goals**  
The goals of this session are for participants to  
- Learn about the current progress on NSF RED projects  
- See how these projects are changing the landscape of engineering education across the U.S.  
- Provide feedback to RED teams to enhance transferability  
- Consider approaches for collaboration and applying lessons from RED projects to their own institutions to enact change

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**T514B - Mentoring Practices and Project Teams**

3:15 p.m. - 4:45 p.m., Room 155 B, Convention Center - Salt Palace  
Sponsor: Educational Research and Methods Division  
Moderators: Robin Fowler, University of Michigan; Elizabeth Litzler, University of Washington

Educational Research and Methods Division Technical Session  
Cultivating the Next Generation: Outcomes from a Learning Assistant Program in Engineering  
- Dr. Ying Cao, Oregon State University  
- Dr. Christina Smith, Brown University  
- Mr. Benjamin David Lutz, Oregon State University  
- Dr. Milo Koretsky, Oregon State University

Student Preferences in Mentoring Practices and Program Features in an S-STEM Scholarship/Mentoring Program  
- Dr. Suzette R. Burckhard, South Dakota State University  
- Dr. JoAnna M. Kant, South Dakota State University  
- Francis Arpan,  
- Dr. Ross Peder Abraham, South Dakota State University  
- Dr. Gregory J. Michna, South Dakota State University

Reflections of S-STEM Faculty Mentors  
- Dr. Suzette R. Burckhard P.E., South Dakota State University  
- Dr. JoAnna M. Kant, South Dakota State University  
- Dr. Gregory J. Michna, South Dakota State University  
- Dr. Ross Peder Abraham, South Dakota State University

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**T514C - Practice III: Multimedia Learning**

3:15 p.m. - 4:45 p.m., Room 259, Convention Center - Salt Palace  
Sponsor: Educational Research and Methods Division  
Moderators: Henriette Burns, Washington State University; Vancouver; Adam Carberry, Arizona State University; Medha Dalal, Arizona State University  
Evaluations.

Dr. Catherine E. Brawner, Research Triangle Educational Consultants  
Ms. Olivia W. Murch, Purdue University  
Dr. Daniel M. Ferguson, Purdue University, West Lafayette (College of Engineering)  
Dr. Matthew W. Ohland, Purdue University, West Lafayette (College of Engineering)

Influences on Variability of Perceptions of Behavior on Student Engineering Project Teams  
Emerald Miller, University of Virginia  
Prof. Reid Bailey, University of Virginia

Effective Review of Prerequisites: Using Videos to Flip the Reviewing Process in a Senior Technical Course  
Dr. Qi Dunsworth, Penn State Behrend  
Dr. Yi “Elisa” Wu, Penn State Behrend

A Protocol-Based Blended Model for Fluid Mechanics Instruction  
Dr. John T. Solomon, Tuskegee University  
Dr. Eric Hamilton, Pepperdine University  
Dr. Vimal Kumar Viswanathan, San Jose State University  
Dr. Chitra R. Nayak, Tuskegee University  
Dr. Firas Akasheh, Tuskegee University

Successfully Flipping a Fluid Mechanics Course Using Video Tutorials and Active Learning Strategies: Implementation and Assessment  
Dr. Faye Linda Wachs, California State Polytechnic University, Pomona  
Prof. Juliana Lynn Faqua, California State Polytechnic University, Pomona  
Dr. Paul Morrow Nissenson, California State Polytechnic University, Pomona  
Dr. Angela C. Shih, California State Polytechnic University, Pomona  
Michael Pavel Ramirez, California State Polytechnic University, Pomona  
Laura Queiroz DaSilva, California State Polytechnic University, Pomona  
Mr. Nguyen Nguyen,  
Miss Cheyenne Romero, California State Polytechnic University, Pomona
Impact of the Flipped Classroom on Students’ Learning and Retention in Teaching Programming
Ms. Shamima Mithun, Indiana University-Purdue University, Indianapolis
Dr. Nancy Evans, Indiana University

Strengthening Student Understanding Through Interactive Classroom Methods in Computer Science and Engineering
Dr. Rania Al-Hammoud P.Eng., University of Waterloo
Dr. Arshia Khan, University of Minnesota, Duluth
Miss Darynne Kathleen Hagen, University of Waterloo

The Graphic Novel: A Promising Medium for Learning Research
Mr. Petr Johanes, Stanford University

**Tuesday, June 26**

**T515A - Electrical and Computer Division
Technical Session 6**
3:15 p.m. - 4:45 p.m., Room 257 B, Convention Center - Salt Palace
Sponsor: Electrical and Computer Division
Moderator: Mohsen Sarraf, University of New Haven

A Pilot Program in Internet-of-things with University and Industry Collaboration: Introduction and Lessons Learned
Dr. Mohsen Sarraf, University of New Haven
Dr. Bijan Karimi, University of New Haven
Dr. Ali Golbazi, University of New Haven
Mr. Arthur Lizotte, Keysight Technologies, Inc.

A New Course for Teaching Internet of Things: A Practical, Hands-on, and Systems-level Approach
Mr. Nicholas Barendt, Case Western Reserve University
Dr. Nigamath Sridhar, Cleveland State University
Dr. Kenneth A. Loparo, Case Western Reserve University

Development of a New Course on Smart-grid Communication and Security for Senior Undergraduate and Graduate Students
Dr. Sasan Haghani, University of the District of Columbia

A Hardware Security Curriculum and its Use for Evaluation of Student Understanding of ECE Concepts
Prof. Aaron Carpenter, Wentworth Institute of Technology

Design and Implementation of Electric Drives Laboratory using Commercial Microcontroller Development Kits
Mr. Bhanu Babaiahgari, University of Colorado, Denver
Mr. Zizhuo Chen, University of Colorado, Denver
Dr. Jae-Do Park, University of Colorado, Denver

**T515B - IEEE Education Society Board of Governors Meeting**
3:15 p.m. - 4:45 p.m., Room 251 C, Convention Center - Salt Palace
Sponsor: Electrical and Computer Division

**T518 - EDGD: CAD, CAM, and AI**
3:15 p.m. - 4:45 p.m., Room 254 C, Convention Center - Salt Palace
Sponsor: Engineering Design Graphics Division
Moderators: Sandra Clavijo, Stevens Institute of Technology (School of Engineering and Science); Steven Kirstukas, Central Connecticut State University

**Integrating CAD and CAM for Design-build Projects**
Dr. Joseph Rudy Ottway, Murray State University

**Case Study of a Blind Student Learning Engineering Graphics**
Mr. Timothy Andrews, Rensselaer Polytechnic Institute

**A Study of Augmented Reality for the Development of Spatial Reasoning Ability**
Dr. John E. Bell, Michigan State University
Cui Cheng, Michigan State University
Dr. Hannah Klautke, Michigan State University
Dr. William Cain, Michigan State University
Dr. Daniel Joseph Freer, Michigan State University
Mr. Timothy J. Hinds, Michigan State University

From Learning to CAD to CADing to Learn: Teaching the Command, Strategic, and Epistemic Dimensions of CAD Software
Dr. Dean Nieusma, Rensselaer Polytechnic Institute
Dr. James W. Malazita, Rensselaer Polytechnic Institute
Ms. Lydia Rebekka Krauss, Rensselaer Polytechnic Institute

**T520 - Ethics Division Business**
3:15 p.m. - 4:45 p.m., Room 251 A, Convention Center - Salt Palace
Sponsor: Engineering Ethics Division

Please join us to welcome new and returning members, discuss new initiatives, and propose changes to enhance the division.

**T523 - ET Projects**
3:15 p.m. - 4:45 p.m., Room 253 A, Convention Center - Salt Palace
Sponsor: Engineering Technology Division
Moderators: Mohammad Uddin, East Tennessee State University; Kevin Cook, Montana State University

End-of-Semester Control System Design Projects by Senior-level EET Students
Dr. Biswajit Ray, Bloomsburg University
Mr. Robert Chambers, Nathan Henry, Bloomsburg University
Mr. Paul Michael Karcher, Student-made Video Projects in Engineering Technology Courses
Dr. Rachel Mosier P.E., Oklahoma State University
Dr. William E. Genereux, Kansas State University
Katie Rieger, Oklahoma State University

Simple, Low-cost IoT/UHF RFID-based Lab Equipment Identification and Tracking System
Dr. Ghassan T Ibrahim, Bloomsburg University

Student Community Project to Design a Mini-golf Project for the City of Leesville, LA
Dr. Mohammed Benalla MB, Vaughn College of Aeronautics & Technology

Product Development Process and Student Learning in an Engineering Technology Capstone Project: Electrical Go-kart
Dr. Angran Xiao, New York City College of Technology
Dr. Andy S. Zhang, New York City College of Technology

Schedule subject to change: Please go to [www.asee.org/icp](http://www.asee.org/icp) for up to date information
Conference Sessions

Tuesday, June 26

T523B - ET Pedagogy II
3:15 p.m. - 4:45 p.m., Room 151 C, Convention Center - Salt Palace
Sponsor: Engineering Technology Division
Moderators: Maury Fortney, Aschalew Kassu, Alabama A&M University

Ms. Joyce Tam, New York City College of Technology

Undergraduate Research-based Learning for Engineering Technology Students
Dr. Mihaela Radu, State University of New York, Farmingdale

Introducing Project-based Engineering Laboratory to Non-engineering Undergraduate Students
Dr. Sudhir Shrestha, Sonoma State University
Dr. Farid Farahmand, Sonoma State University

Lessons from Two Years of ePortfolio Implementation in Engineering Technology Courses
Dr. Orlando M. Ayala, Old Dominion University
Dr. Otilia Popescu, Old Dominion University

Developing Improved Methodology for Online Delivery of Coursework Providing a Framework for Quality Online Education
Mr. Veto Matthew Ray, Indiana University-Purdue University of Indianapolis

A Comparative Study of Distance Education and Face-to-Face Lab Students
Dr. Garth V. Crosby, Southern Illinois University, Carbondale

T524 - Entrepreneurship & Engineering Innovation Division Technical Session 5
3:15 p.m. - 4:45 p.m., Room 355 D, Convention Center - Salt Palace
Sponsor: Entrepreneurship & Engineering Innovation Division
Moderators: Sami Ainane, University of Maryland, College Park; Prateek Shekhar, University of Michigan

Critical Incidents in Engineering Students' Development of More
Comprehensive Ways of Experiencing Innovation
Dr. Nicholas D. Fila, Iowa State University
Dr. Justin L. Hess, Indiana University-Purdue University of Indianapolis

Making Sense of Gender Differences in the Ways Engineering Students Experience Innovation: An Abductive Analysis
Dr. Nicholas D. Fila, Iowa State University
Dr. Rachel E. Friedensen, Iowa State University
Dr. Mani Mina, Iowa State University
Dr. Benjamin Ahn, Iowa State University

Integrating an Innovation Concentration into the Engineering Curriculum
Dr. Karl D. Schubert, University of Arkansas
Mrs. Leslie Bartsch Massey, University of Arkansas

Mr. Clint E. Johnson, University of Arkansas
Assessing the Development of Empathy and Innovation Attitudes in a Project-based Engineering Design Course
Mr. Antti Oskari Surma-aho, Aalto University
Dr. Tua A. Bjorklund, Aalto University
Prof. Katja Holttta-Otto, Aalto University

Analysis of Student Utilization and Activities in a Campus Innovation Center
Dr. William A. Kline, Rose-Hulman Institute of Technology
Dr. Timothy Chow, Rose-Hulman Institute of Technology
Dr. Tony Ribera, Rose-Hulman Institute of Technology

T526 - Panel Session
3:15 p.m. - 4:45 p.m., Salon G, HQ Hotel - Marriott at City Creek
Sponsor: Experimentation and Laboratory-Oriented Studies Division
The interactive BYOE session. It is an open forum where people move from one station to the next.

BYOE: The Fidget Car—An Apparatus for Small-group Learning in Systems and Controls
Prof. Laura E. Ray, Dartmouth College
Raina White, Dartmouth College
Dr. David M. Feinauer P.E., Norwich University
Mr. David A. Hodgson, Union College
Dr. Eric B. Welch, Christian Brothers University
Dr. Yeu-Sheng P. Shiue, Christian Brothers University
Dr. Carlos L. Luck, University of Southern Maine
Mr. Jonathan West, University of New Mexico
Dr. Blair T. Allison, Grove City College
Prof. Kevin Huang, Trinity College
Dr. Nathan Amanquah, Ashesi University College
Mr. Daniel Logan Ray, Devin Tracey Montgomery, Dartmouth College
Dr. Prudence Merton, Dartmouth College
Dr. Vanessa Svhila, University of New Mexico

BYOE: Comparison of Vertical- and Horizontal-axis Wind Turbines
Dr. Bridget M. Smyser, Northeastern University
Mr. Kevin F. McCue, Northeastern University
Rebecca Knepple, Northeastern University

BYOE: Circuit Modules for Visualizing Abstract Concepts in Introductory Electrical Engineering Courses
Dr. Harry Courtney Powell, University of Virginia

T527A - First-year Programs Division: Retention
3:15 p.m. - 4:45 p.m., Room 151 A, Convention Center - Salt Palace
Sponsor: First-Year Programs Division
Moderators: Joshua Hertz, Northeastern University; Brianna Dorie, Gonzaga University

This session includes five full paper presentations related to retention.

A Creative First-year Program to Improve the Student Retention in Engineering
Dr. Maryam Darbeheshti, University of Colorado, Denver
Mr. Dakota Ryan Edmonds, University of Colorado, Denver

Schedule subject to change: Please go to www.asee.org/icp for up to date information
A Strategic Plan to Improve Engineering Student Success: Development, Implementation, and Outcomes
Dr. Jerome P. Lavelle, North Carolina State University
Dr. Matthew T. Stimpson, North Carolina State University
An Integrated Supplemental Program to Enhance the First-year Engineering Experience
Dr. Oredel Brown, Northwestern University
Robin A.M. Hensel Ed.D., West Virginia University
Dr. Melissa Lynn Morris, West Virginia University
Mr. Joseph Dygert, West Virginia University
Effectiveness of freshman level multi-disciplinary hands-on projects in increasing student retention rate and reducing graduation time for engineering students in a public comprehensive university
Dr. Binod Tiwari, California State University, Fullerton
Dr. Pradeep Nair, California State University, Fullerton
Dr. Susamma Barna, California State University, Fullerton
Bridges and Barriers: A multi-year study of workload-related learning experiences from diverse student and instructor perspectives in first-year engineering education
Ms. Darlee Gerrard, University of Toronto
Prof. Chirag Varia, University of Toronto

T527B - FPD and DEEDs Joint Postcard Sessions
3:15 p.m. - 4:45 p.m., Salon F, HQ Hotel-Marriott at City Creek
Sponsors: First-Year Programs Division; Design in Engineering Education Division
Moderator: James Hylton, Ohio Northern University
FPD and DEEDs joint postcard session. Eight to ten mini-presentations followed by interactive discussions with individual authors related to engineering design in the first year.
Tracking Skills Development and Self-efficacy in a New First-year Engineering Design Course
Jessica Daniels,
Dr. Sophia T. Santillan, Duke University
Dr. Ann Saterbak, Duke University
Work in Progress: Using Current Crowdfunding Projects as Case Studies to Enhance Students’ Understanding of the Design Process
Dr. Derek Breid, Saint Vincent College
Work in Progress: Building the Undergraduate Chemical Engineering Community by Involving Capstone Design Students in Undergraduate Courses
Dr. Ryan Anderson, Montana State University
Dr. Abigail M. Richards, Montana State University
Work in Progress: Development and Implementation of a Self-guided Arduino Module in an Introductory Engineering Design Course
Dr. Jillian Beth Schmidt, Missouri University of Science & Technology
Work in Progress: Building a Functional Cardiograph Over Four Semesters
Dr. Gail Baura, Loyola University Chicago
Dr. Leanne Kallemeyn, Loyola University Chicago
Mr. Noe Arroyo,

Dr. Vincent C.F. Chen, Loyola University Chicago
Mr. Allan Beale,
Enhancing 3D modeling with Augmented Reality in an After-school Engineering Program (Work in Progress)
Miss Srinjita Bhaduri, University of Colorado, Boulder
Katie Van Horn Ph.D., University of Colorado, Boulder
Mr. Peter Gyory, University of Colorado, Boulder
Ms. Hannie Ngo,
Prof. Tamara Sumner, University of Colorado, Boulder
Work in Progress: Introduction of Failure Analysis to a First-year Robotics Course
Dr. Kathleen A. Harper, Ohio State University
Dr. Richard J. Freuler, Ohio State University
Lauren Corrigan, Parker School Hawaii

T532 - Global and Intercultural Competency
3:15 p.m. - 4:45 p.m., Room 151 B, Convention Center - Salt Palace
Sponsor: International Division
Moderators: Anna Friesel, Technical University-Copenhagen; Maria Alves, Texas A&M University
Comparison of International Students’ Competency Levels in the Fundamentals of Engineering Technology Courses
Dr. Mauricio Torres, Northern Kentucky University
Dr. Morteza Sadat-Hosseiny, Northern Kentucky University
Development of Students’ Intercultural Knowledge and Competence
Dr. James Warnock, University of Georgia
Ms. Galyna Melnychuk, Mississippi State University
Global Engineering Competency: Assessment Tools and Training Strategies
Prof. Brent K. Jesiek, Purdue University, West Lafayette
Prof. Natasha Trellinger Buswell, University of California, Irvine
Dr. Qin Zhu, Colorado School of Mines
Integration of Global Competencies in the Engineering Curriculum
Mr. Eugene Rutz, University of Cincinnati
Preparing Engineering College Students for a Culturally Diverse Global Job Market
Dr. Maria Claudia Alves, Texas A&M University
The Impact of the EWB Design Summit on the Professional Social Responsibility Attitudes of Participants
Dr. Scott Daniel, Swinburne University of Technology
Dr. Nick John Brown, Engineers Without Borders Australia

T533A - Robotics
3:15 p.m. - 4:45 p.m., Room 150 G, Convention Center - Salt Palace
Sponsor: Pre-College Engineering Education Division
Moderator: Meagan Pollock, National Alliance for Partnerships in Equity
The role of robotics in engineering education is the focus of this session.
Do After-school Robotics Programs Expand the Pipeline into STEM Majors in College? (RTP)
Dr. Cathy Burack, Brandeis University
Mr. Alan Melchior, Brandeis University
Schedule subject to change: Please go to www.asee.org/icp for up to date information
Conference Sessions Tuesday, June 26

Matthew Hoover, Brandeis University
Fundamental: Determining Prerequisites for Middle School Students to Participate in Robotics-based STEM Lessons: A Computational Thinking Approach
Dr. S.M. Mizanoor Rahman, New York University
Sonia Mary Chacko, New York University
Dr. Sheila Borges Rajguru, New York University
Dr. Vikram Kapila, New York University

Fundamental: Analyzing the Effects of a Robotics Training Workshop on the Self-efficacy of High School Teachers
Mr. Abhidipta Mallik, New York University
Dr. Sheila Borges Rajguru, New York University
Dr. Vikram Kapila, New York University

Fundamental: Examining the Variations in the TPACK Framework for Teaching Robotics-aided STEM Lessons of Varying Difficulty
Mr. Abhidipta Mallik, New York University
Dr. S.M. Mizanoor Rahman, New York University
Dr. Sheila Borges Rajguru, New York University
Dr. Vikram Kapila, New York University

Fundamental: Optimizing a Teacher Professional Development Program for Teaching STEM with Robotics Through Design-based Research
Dr. S.M. Mizanoor Rahman, New York University
Mrs. Veena Jayasree Krishnan, New York University
Dr. Vikram Kapila, New York University

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T533B - NGSS & Engineering Education
3:15 p.m. - 4:45 p.m., Room 255 D, Convention Center - Salt Palace
Sponsor: Pre-College Engineering Education Division
Moderator: Kuldeep Rawat, Elizabeth City State University
The intersection of NGSS and engineering education is explored in this session.

A Content Analysis of NGSS Science and Engineering Practices in K-5 Curricula
Jessica Cellitti, Drexel University
Miss Rasheda Likely, Drexel University
Magdalene Kate Moy, Drexel University
Dr. Christopher George Wright, Drexel University

Design of Design: Empowering K-12 Educators to Develop Unique Standards-aligned Engineering Design Exercises in Their Own Classrooms
Dr. Amy Trauth, University of Delaware
Prof. Jenni Buckley, University of Delaware
Dr. Debra J. Coffey, University of Delaware

Tensions Arising When Teaching Scientific Disciplinary Core Ideas via Engineering Practices (Evaluation)
Hannah Smith Brooks, University of Texas at Austin
Dr. Todd L. Hutner, University of Texas at Austin
Dr. Victor Sampson, University of Texas at Austin
Mr. Lawrence Chu, University of Texas at Austin
Dr. Richard H. Crawford, University of Texas at Austin
Dr. Stephanie Rivale, University of Texas at Austin
Christina L. Baze, University of Texas at Austin

The State of Engineering Integration in K-12 Science Standards:

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T533C - Girls in Engineering
3:15 p.m. - 4:45 p.m., Room 255 A, Convention Center - Salt Palace
Sponsor: Pre-College Engineering Education Division
Moderators: Morgan Hynes, Purdue University-Main Campus, West Lafayette (College of Engineering); Morgan Hynes, Arizona State University
The focus of this session is on programs created to improve women's understanding of engineering.

Believing Girls Belong in Engineering: Do We? So What? (Fundamental, Diversity)
Ms. Henriette D. Burns, Washington State University, Vancouver
Sean Palmer Marquardt Rice, Washington State University, Vancouver

Developing and Assessing a Music Technology and Coding Workshop for Young Women
Ms. Abigail Jugiela, University of St. Thomas
Jenna Lalemant, University of St. Thomas
Ms. Paige Huschka, University of St. Thomas
Dr. Deborah Besser P.E., University of St. Thomas
Dr. AnnMarie Thomas, University of St. Thomas

The Effectiveness of a Multi-year Engineering Enrichment Workshop for Young Women
Dr. Linda Hirsch, New Jersey Institute of Technology

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T534 - Imagining Others, Defining Self Through Consideration of Ethical and Social Implications
3:15 p.m. - 4:45 p.m., Room 155 E, Convention Center - Salt Palace
Sponsor: Liberal Education/Engineering & Society Division
Moderator: Sara Atwood, Elizabethtown College
The focus of this session is on programs created to improve women's understanding of engineering.

Examining the Relationships Between How Students Construct Stakeholders and the Ways Students Conceptualize Harm from Engineering Design
Alexis Papak, University of Maryland, College Park
Dr. Ayush Gupta, University of Maryland, College Park
Dr. Chandra Anne Turpen, University of Maryland, College Park

Engineers’ Imaginaries of ‘The Public’: Dominant Themes from Interviews with Engineering Students, Faculty, and Professionals
Dr. Nathan E. Canney, CYS Structural Engineers Inc.

Exploring Students’ and Instructors’ Perceptions of Engineering: Case Studies of Professionally Focused and Career Exploration Courses
Dr. Idalis Villanueva, Utah State University
Dr. Louis S. Nadelson, Colorado Mesa University
Dr. Jana Bouwma-Gearhart, Katherine L. Youmans, Utah State University
Sarah Lanci, Colorado Mesa University
Dr. Adam Lenz, Oregon State University

Challenges and Opportunities in International Service Learning
Tuesday, June 26

**Conference Sessions**

**T535 - Manufacturing Curriculum and Course Innovations**
3:15 p.m. - 4:45 p.m., Room 260 B, Convention Center - Salt Palace
Sponsor: Manufacturing Division
Moderators: Aditya Akundi, University of Texas, El Paso; Yalcin Ertekin, Drexel University (Tech.) (MERGED)
Manufacturing Curriculum and Course Innovations

Additive Manufacturing Studios: a New Way of Teaching ABET Student Outcomes and Continuous Improvement
Dr. Ismail Fidan, Tennessee Technological University
Dr. George Chitiyo, Tennessee Technological University
Mr. Thomas Singer, Sinclair Community College
Mr. Jamshid Moradmand, Sinclair Community College

Development of Multifunctional Educational Spaces
Dr. Arif Sirinterlikci, Robert Morris University

Understanding Surface Quality: Beyond Average Roughness (Ra)
Dr. Chittaranjan Sahay P.E., University of Hartford
Dr. Suhash Ghosh, University of Hartford

**T536 - Materials Division Technical Session 2**
3:15 p.m. - 4:45 p.m., Room 260 A, Convention Center - Salt Palace
Sponsor: Materials Division
Moderators: Amber Genau, University of Alabama at Birmingham; Janet Callahan, Boise State University

Integrating Experimental Studies into a Senior Level Course: Smart Materials and Structures
Dr. Ping Zhao, University of Minnesota Duluth
Dr. Hongyan Liu, Colorado School of Mines
Dr. Puttagounder Dhanasekaran Swaminathan, University of Minnesota Duluth

Development of a Materials Science Educational Program at Houston Community College: University Partnerships and Assessment Dynamics
Mr. Bartlett Michael Sheinberg, Houston Community College
Dr. Amanda Smith Hackler, STEM Evaluations and Educational Consulting Services, LLC

Undergraduate Research in a Materials Independent Study at a Small College: From Building Modern Fabrication Equipment to Experimental Testing
Dr. Tristan M. Ericson, York College of Pennsylvania
Dr. Stephen N Kuchnicki, York College of Pennsylvania

Incorporating Active Learning and Sustainable Engineering Concepts into a Required Materials Class
Dr. William M. Jordan, Baylor University

m-POGIL (modified-Process Oriented Guided Inquiry Learning) based Plastics Laboratory
Dr. Spencer Seung-hyun Kim, Rochester Institute of Technology (CAST)

**T537A - Mathematics Division Technical Session 4**
3:15 p.m. - 4:45 p.m., Room 155 C, Convention Center - Salt Palace
Sponsor: Mathematics Division
Moderator: Doug Bullock, Boise State University

Design of an International Bridge Program for Engineering Calculus
Dr. Sandra B Nite, Texas A&M University
Dr. Brady Creel, Texas A&M University at Qatar
Dr. Jim Morgan, Charles Sturt University
Ms. Jowaher E. Almarri,

Prevalent Mathematical Pathways to Engineering in South Carolina
Dr. Eliza Gallagher, Clemson University
Dr. Christy Brown, Dr. D. Andrew Brown, Clemson University
Dr. Kristin Kelly Frady, Clemson University
Dr. Bradley J. Putman, Clemson University
Dr. Hossein Haj-Hariri, University of South Carolina
Dr. hope epp rivers,
Dr. Patrick Bass, The Citadel
Dr. Michael A. Matthews P.E., University of South Carolina
Dr. Thomas T Peters, South Carolina's Coalition for Mathematics & Science
Dr. Robert J. Rabb P.E., The Citadel
Prof. Ikhalfani Solan,
Dr. Ronald W. Welch P.E., The Citadel
Dr. Stanley N. Ihekweazu, South Carolina State University
Dr. Anand K. Gramopadhye, Clemson University

Technology’s Role in Student Understanding of Mathematics in Modern Undergraduate Engineering Courses
Andrew Phillips, The Ohio State University

The Benefit of Training Undergraduate Teaching Assistants
Dr. Gianluca Guadagni, University of Virginia
Dr. Hui Ma, University of Virginia
Prof. Lindsay Wheeler, University of Virginia

University Students’ Ability to Interconnect the Calculus Concepts and Function Graphing
Dr. Emre Tokgoz, Quinnipiac University
Miss Hazal Ceyhan, Ankara University

**T538 - Mechanical Engineering Division Technical Session 6**
3:15 p.m. - 4:45 p.m., Room 255 B, Convention Center - Salt Palace
Sponsor: Mechanical Engineering Division
Moderator: Charles Baukal, John Zink Co. LLC

Using Capstone Projects for Community Outreach
Dr. Carmen Cioc, The University of Toledo
Dr. Sorin Cioc, The University of Toledo

Schedule subject to change: Please go to www.asee.org/icp for up to date information
T538B - Mechanical Engineering Division Technical Session 7
3:15 p.m. - 4:45 p.m., Room 252, Convention Center - Salt Palace
Sponsor: Mechanical Engineering Division
Moderator: Vishal Mehta, Ohio Northern University

Redesign of an Introduction to Mechanical Engineering Course to Keep Students Engaged and Interested
Dr. Olivier Putzeys P.E., University of Maine
Dr. Masoud Rais-Rohani P.E., University of Maine
Serge Raymond Maalouf, University of Maine

Stimulating Interest in First-Year Mechanical Engineering Manufacturing
Dr. Todd Letcher, South Dakota State University
Dr. Gregory J. Michna, South Dakota State University
Mr. John D VerSteeeg, South Dakota State University
Ms. Sarah M. Michna, South Dakota State University

Faculty Perceptions of the Teaching and Learning Experience in Fundamental Mechanical Engineering Courses
Ms. Michelle Soledad, Virginia Tech, Ateneo de Davao University
Dr. Holly M Matsudovich, Virginia Tech
Dr. Cheryl Carrico P.E., Virginia Tech

A Foundational Engineering Science Course and Its Impact on the Student Experience
Mr. Richard A. Springman P.E., The University of Toledo

Dr. Kamau Wright, University of Hartford
Dr. Ivana Milanovic, University of Hartford
Dr. Tom A. Eppes, University of Hartford

Introducing Social Relevance and Global Context into the Introduction to Heat Transfer Course
Dr. Elizabeth A. Reddy, University of San Diego
Dr. Breanne Przestrzelski, University of San Diego
Dr. Susan M Lord, University of San Diego
Dr. Imane Khalil, University of San Diego

Students' Perception of a Summer Undergraduate Research Experience: Across the Disciplines
Dr. Simon Thomas Ghanat P.E., The Citadel
Dr. Dena Garner, The Citadel
Dr. Jason Howison, The Citadel
Dr. Rebecca A. Hunter, The Citadel
Dr. Breanne Baker Swart, The Citadel
Dr. Shankar Madhab Banik, The Citadel
Dr. Michael P. Verdicchio, The Citadel
Dr. Nathan John Washuta, The Citadel

Designing and Building Devices for Industry: A Capstone Design Project Experience
Dr. Morteza Nurcheshmeh P.E., Western Kentucky University
Dr. Christopher Byrne P.E., Western Kentucky University

Those Who Teach It
Dr. Phillip Cornwell, Rose-Hulman Institute of Technology
Dr. Donald E. Richards, Rose-Hulman Institute of Technology
Dr. Glen A. Livesay, Rose-Hulman Institute of Technology

Let's Not Throw Away that Big and Bulky Manipulator – Revitalize It!
Mr. John D VerSteeg, South Dakota State University
Dr. Gregory J. Michna, South Dakota State University
Dr. T rung H Duong, Colorado State University-Pueblo
Dr. Nebojsa I. Jaksic, Colorado State University, Pueblo

T539 - Enhancing the Statics Classroom
3:15 p.m. - 4:45 p.m., Room 255 F, Convention Center - Salt Palace
Sponsor: Mechanics Division
Moderator: Joseph Rencis, California State Polytechnic University, Pomona

Statics is a foundational course for most engineering disciplines that teaches skills and concepts that will be useful for the rest of the student's career. Papers in this session examine the teaching of statics and the student experience.

Standardizing the Statics Curriculum Across Multiple Instructors
Dr. Kimberly B. Demoret P.E., Florida Institute of Technology
Dr. Jennifer Schlegel, Florida Institute of Technology

Statics Modeling Kit: Hands-On Learning in the Flipped Classroom
Mr. Eric Davishah, Whatcom Community College
Mr. Russell Pearce, Whatcom Community College

Teaching Statics Using Agile Methodologies
Dr. Anna K.T. Howard, North Carolina State University
Dr. Elizabeth A. Reddy, University of San Diego

Designing and Building Devices for Industry: A Capstone Design Project Experience
Dr. Morteza Nurcheshmeh P.E., Western Kentucky University
Dr. Christopher Byrne P.E., Western Kentucky University

Toward a Multi-Dimensional Taxonomy for Statics Problem Classification and Problem-Solving
Dr. Ruth E. H. Wertz, Valparaiso University

T541 - Multidisciplinary Curricular Design and Assessment
3:15 p.m. - 4:45 p.m., Room 155 A, Convention Center - Salt Palace
Sponsor: Multidisciplinary Engineering Division
Moderators: Gouranga Banik, Oklahoma State University; Nicole Pitterson, Virginia Polytechnic Institute & State University

Work in Progress: Flexibility and Professional Preparation via a Multidisciplinary Engineering Curriculum
Dr. Noah Salzman, Boise State University
Dr. Vicki Stieha, Boise State University
Dr. Amy J. Moll, Boise State University
Dr. JoAnn S. Lighty, Boise State University

Redesigning Undergraduate Engineering Education at MIT – the New Engineering Education Transformation (NEET) initiative
Prof. Edward F. Crawley, Massachusetts Institute of Technology
Prof. Anette "Peko" Hosoi, Massachusetts Institute of Technology

Conference Sessions Tuesday, June 26

Schedule subject to change: Please go to www.asee.org/icp for up to date information

125 YEARS AT THE HEART OF ENGINEERING EDUCATION
Conference Sessions

Tuesday, June 26

**T542 - Classroom Strategies – New Engineering Educators Division**
3:15 p.m. - 4:45 p.m., Room 257 A, Convention Center - Salt Palace
**Sponsor: New Engineering Educators Division**
**Moderator: Janie Brennan, Washington University in St. Louis**
Discover classroom strategies to encourage student success.

- **Building a Physical Model to Teach Creative Problem-solving Skills in Online and Live Courses**
  - Prof. Ralph Ocon, Purdue University Northwest

- **It's Not Rocket Science: The Flipped Classroom in Space Mechanics**
  - Prof. Kaela Martin, Embry-Riddle Aeronautical University, Prescott
  - Dr. Jonathan Mark Gallimore, Embry-Riddle Aeronautical University, Prescott

- **It Takes All Kinds: Incorporating Diversity Education in the Engineering Classroom**
  - Dr. Elif Miskioglu, Bucknell University

- **A Study on the Student Success in a Blended-Model Engineering Classroom**
  - Dr. Vimal Kumar Viswanathan, San Jose State University
  - Dr. John T. Solomon, Tuskegee University

- **Lowman’s Model Goes Back to the Movies**
  - Dr. Clifton B. Farnsworth, Brigham Young University
  - Dr. Jennifer Retherford P.E., University of Tennessee, Prescott
  - Dr. Jennifer Retherford P.E., University of Tennessee, Prescott

- **Cross-Case Analysis: K-12 International Teachers’ Perspectives on Integrated STEM and Computational Thinking Practices**
  - Mrs. Cristina Diordiev, Texas Tech University
  - Dr. Ibrahim H. Yeter, Purdue University-Main Campus, West Lafayette (College of Engineering)

**T546 - Crafting the Future of Computing Education in CC2020**
3:15 p.m. - 4:45 p.m., Room 151 F, Convention Center - Salt Palace
**Sponsors: Software Engineering Division; Computing and Information Technology Division**
**Moderator: Stephen Frezza, Gannon University**
**Speakers: Dr. Marisa Exter, Purdue University-Main Campus,**
West Lafayette (College of Engineering); **Prof. Arnold Neville Pears, Uppsala University**; **Dr. Barry M. Lunt, Brigham Young University**
Several national and international computing and engineering organizations are in the process of developing a new curricular document tentatively titled "Computing Curricula 2020" (CC2020). This curricular project, based on its predecessor CC2005, intends to reflect the state of the art in computing education and practice as well as the future of the computing educational field for the 2020s. This panel provides an overview of the CC2005 report and its transition to the CC2020 project. It also provides unique perspectives from members of the CC2020 task force. The panel authors and participants will engage in lively discussions on ways to include computing as a significant component of the project and extend its influence in global undergraduate computing education for the future. The authors anticipate full audience involvement and participation in formulating this vision.

**Crafting the Future of Computing Education in CC2020: A Workshop**
- Dr. Stephen T Frezza, Gannon University
- Prof. Arnold Neville Pears, Uppsala University
- Dr. Marisa Exter, Purdue University, West Lafayette (College of Engineering)
- Dr. Barry M. Lunt, Brigham Young University

**T547 - Engineering Education Graduate Research Consortium (EEGRC) Poster Session**
3:15 p.m. - 4:45 p.m., Salon I, HQ Hotel - Marriott at City Creek
**Sponsor: Student Division**
**Engineering Education Graduate Research Consortium (EEGRC) Poster Session**

- **Active Learning Group Work: Helpful or Harmful for Women in Engineering?**
  - Ms. Megan Keogh, University of Colorado, Boulder
  - Dr. Malinda S Zarske, University of Colorado, Boulder

- **Connecting with first-year engineering students’ interest in social responsibility issues through ethics lessons**
  - Ms. Kathryn Wangaman, University of Colorado Boulder
  - Dr. Janet Y Tsai, University of Colorado, Boulder
  - Dr. Malinda S Zarske, University of Colorado, Boulder

- **Cross-Case Analysis: K-12 International Teachers’ Perspectives on Integrated STEM and Computational Thinking Practices**
  - Mrs. Cristina Diordiev, Texas Tech University
  - Dr. Ibrahim H. Yeter, Purdue University-Main Campus, West Lafayette (College of Engineering)
  - Dr. Walter Smith, Texas Tech University

- **Exploration of expert and novice reasoning in mechanics of solids**
  - Ms. Johanna Paulette Doukakis, Rutgers, The State University of New Jersey
  - Prof. Eugenia Etkina,

- **Exploring the Unique Skills and Challenges Disabled Veterans Bring to College: A Qualitative Study in Engineering**
  - Mr. Michael Scott Sheppard Jr., Arizona State University, Polytechnic campus

- **Investigating Computational Thinking Self-Efficacy Beliefs of Pre-
Conference Sessions

T547B - Student Division Technical Session 1
3:15 p.m. - 4:45 p.m., Room 355 E, Convention Center - Salt Palace
Sponsor: Student Division

Changing of the Guard: Tips for Enabling Smooth Officer Transitions
Monika Ingalls,
Dr. Elizabeth Hill, University of Minnesota Duluth
Ms. Helene Finger P.E., California Polytechnic State University, San Luis Obispo
Dr. Marca J. Lam, Rochester Institute of Technology (COE)
Dr. Gloria Guohua Ma, Wentworth Institute of Technology
Dr. Diane L. Peters, Kettering University
Prof. Stephanie G Wettstein, Montana State University, Montana Engineering Education Research Center
Dr. Deborah S. Won, California State University, Los Angeles
Dr. Claudia Mara Dias Wilson, New Mexico Institute of Mining and Technology
Cheyenne Florenia Rivera,
Ms. Emily Silva, California State University, Los Angeles
Tara Sundsted, Montana State University-Bozeman

Work in Progress - the Undergraduate Perspective: How to Survive an Undergraduate Engineering Program
Bryon Kucharski, Wentworth Institute of Technology
Prof. Aaron Carpenter, Wentworth Institute of Technology
Dr. Joan Giblin, Wentworth Institute of Technology
Dr. Mehmet Ergizer, Wentworth Institute of Technology

Peer-led Research Methods Workshop for First-year Ph.D. Students (Student Paper)
Mr. Vincent Joseph Tocco Jr., University of Florida
Mr. Kevin Buettner,
Ms. Madeline G Sciullo, University of Florida
Dr. Jennifer Sinclair Curtis, University of California, Davis
Dr. Jason E. Butler, University of Florida

First Year Engineering Students Perceptions of Engineering
Ms. Marigold F. Bays-Muchmore, University of Illinois at Urbana Champaign
Dr. Alexandra Chronopoulou, University of Illinois, Urbana-Champaign

T548 - Systems Engineering Division Technical Session 4 – Systems Thinking Integration and Systems Engineering Skills Evaluation
3:15 p.m. - 4:45 p.m., Room 151 G, Convention Center - Salt Palace
Sponsor: Systems Engineering Division
Moderator: Federica Robinson-Bryant, Embry-Riddle Aeronautical Univ., Daytona Beach

Integrating Systems Thinking in Interdisciplinary Education Programs: A Systems Integration Approach
Dr. Adedeji B. Badiru P.E., Air Force Institute of Technology
Lt. Col. LeeAnn Racz, US Air Force School of Aerospace Medicine

Development of a Survey Instrument to Evaluate Student Systems Engineering Ability
Diane Constance Alosio, Purdue University
Dr. Karen Marais, Purdue University
Hanxi Sun, Purdue University

Developing a Systems Thinking Integration Approach for Robust Learning in Undergraduate Engineering Courses
Dr. Federica Robinson-Bryant, Embry-Riddle Aeronautical University- Worldwide

Automated Assessment of Systems Engineering Competencies
Peizhu Zhang, Stevens Institute of Technology (School of Systems & Enterprises)
Prof. Jon Patrick Wade, Stevens Institute of Technology (School of Systems & Enterprises)

T549 - Using Modern Technology to Educate and Inspire Non-STEM Majors
3:15 p.m. - 4:45 p.m., Room 155 D, Convention Center - Salt Palace
Sponsor: Technological and Engineering Literacy/Philosophy of Engineering Division
Moderator: John Krupczak, Hope College
Speaker: Dr. Maria E. Garlock P.E., Princeton University

This panel will explain and discuss ways that recent technological developments might be used to overcome barriers to educating and inspiring non-STEM majors. MOOCs, MakerSpaces, and flipped classrooms bring new potential to efforts to promote engineering and technological literacy. Effective courses can be broadly disseminated through MOOCs, overcoming the limitations of the individual instructor model. MakerSpaces are proliferating across campus, bringing access to 3-D printers, laser cutters, and DIY electronics to all students. Filming the lecture in advance to flip the classroom can and has been used to educate non-majors in new ways. Panelists will describe some of their own innovations and successes in these areas and lead a discussion with the audience to envision and inspire creative ways to use MOOCs, MakerSpaces, and other new technologies to help all students develop a broad understanding of the products and methods of engineering.

T550A - STEM Initiatives in Scouting
3:15 p.m. - 4:45 p.m., Room 254 B, Convention Center - Salt Palace
Sponsor: Two-Year College Division

Schedule subject to change: Please go to www.asee.org/icp for up to date information
T550B - High School Math and Its Effects on Engineering and Engineering Technology Enrollment
3:15 p.m. - 4:45 p.m., Salon H, HQ Hotel - Marriott at City Creek
Sponsor: Two-Year College Division
Moderator: Lawrence Chatman, Camden County College
Speaker: Dr. Andrew Grossfield P.E., Vaughn College of Aeronautics & Technology
Common sense tips to overcome high school and two-year math anxiety as a means to increase enrollment in engineering and engineering technology programs.

T552 - Engagement in Practice: Creating a Robust Infrastructure for Community Engagement
3:15 p.m. - 4:45 p.m., Room 258, Convention Center - Salt Palace
Sponsor: Community Engagement Division
Moderator: William Oakes, Purdue University-Main Campus, West Lafayette (College of Engineering)
“Engagement in Practice” sessions include short presentations of each paper (3-5 minutes) with ample time remaining for facilitated discussion and sharing by presenters and members of the audience. Papers in this session are focused on providing descriptive detail of specific community engagement endeavors.

T556 - The Military and Veterans Division Panel Sessions
3:15 p.m. - 4:45 p.m., Room 150 F, Convention Center - Salt Palace
Sponsor: Military and Veterans Division
Moderator: Keith Landry, Georgia Southern University
The Military and Veterans Division is hosting a panel session to discuss veterans transitioning to two- and four-year institutions to study engineering and related fields. Members from higher-learning institutions and military installations in the Salt Lake City area will be providing their perspectives.

T580 - Engineering Inclusive Teaching Classrooms: a Professional Development Workshop
3:15 p.m. - 4:45 p.m., Room 151 E, Convention Center - Salt Palace
Sponsors: Faculty Development Constituency Committee; ASEE Diversity Committee
Speaker: Dr. Tershia A. Pinder-Grover, University of Michigan
Objectives:
By the end of the session, participants will be able to:
• Define inclusive teaching and describe its relevance in the engineering context
• Reflect on how students’ social identities (and their own) influence experiences in the classroom
• Identify specific inclusive teaching practices for use in a variety of situations
Description of session:
The deliberate use of inclusive teaching practices enable instructors to create a classroom environment that welcomes all students, values their contributions, and supports their success. In this 90-minute workshop, participants will define inclusive teaching, reflect on the
impact of social identities on teaching in engineering, and brainstorm strategies to promote an inclusive learning environment in a range of classroom scenarios.

Establishing and promoting an inclusive learning environment in science, engineering, technology, and math (STEM) has been identified as one key element to improving the retention of underrepresented students (Seymour & Hewitt, 1997; O’Neal et. al., 2007), their sense of belonging (Walton & Cohen, 2011), and their ability to learn effectively due to the activation of stereotype threat (Steele, 2010; Eschenbach et. al, 2014). Although underrepresented groups may have the most to gain, teaching inclusively is likely to improve student retention and enhance the academic performance of all students.

To achieve this goal, the role of instructors in fostering these environments is essential. A recent article focusing on gender equity discourse indicates that the majority of STEM faculty were less likely to profess gender intervention discourse which “supports active pedagogical intervention to promote equity in practice” (Blair et. al. 2017). How can faculty create a welcoming, equitable, and inclusive class climate for a diverse range of students when they may not feel equipped to do so?

In this workshop, participants will reflect on their own practice and gain strategies that they can immediately apply in their teaching contexts.

Agenda:
- **Definition of Inclusive Teaching (15 minutes):** Participants will define inclusive teaching in engineering individually, discuss why inclusive teaching is important in small groups, and exchange ideas with their peers and the presenter about the implications for engineering.
- **Social Identities (15 minutes):** Participants will reflect individually on their own and their students’ social identities. In pairs, they will discuss reasons why social identities (the instructor and the students) matter in the engineering teaching-learning environment. In their discussions, participants will be encouraged to only share as much or as little as they feel comfortable about their own social identities.
- **Continuum of Classroom Climate (40 minutes):** Participants will learn about a continuum of classroom climate adapted from Ambrose et.al (2010). It describes classroom situations in one of four categories:
  - Explicitly marginalizing – environments that are overtly hostile, discriminatory, and unwelcoming,
  - Implicitly marginalizing – environments where certain people and perspectives are excluded in subtle and unintentional ways,
  - Implicitly inclusive – environments where there are unplanned instructor responses that validate alternative perspectives raised by students, and
  - Explicitly inclusive – environments where the instructor is making intentional choices to enhance students' learning experience.

Participants will review several scenarios and characterize where these situations fall on the climate continuum. They will discuss their ratings and their reasons in partners or small groups. Sample scenarios may include:
- When asking questions, the instructor consistently addresses the whole group and calls upon the first student who raises a hand.
- A student makes a disparaging comment about a political figure, and the instructor ignores it and continues with the lesson.
- The instructor highlights women pioneers in the engineering field. For class scenarios that are identified as explicitly marginalizing, implicitly marginalizing or implicitly inclusive, the participants will discuss ways to alter the instructor’s choices to promote more inclusion.
- **Inclusive Teaching Reflection (15 minutes):** Participants will review an inclusive teaching reflection inventory to identify additional evidence-based strategies they might employ in their teaching contexts. They will discuss in partners one strategy they already use and one strategy that they’d like to try in the future. Each participant will make a commitment to choose one inclusive teaching practice to use the next time they teach.
- **Conclusion (5 minutes):** The presenter will review the key principles discussed during the session and provide the participants with a handout describing the research basis for the inclusive teaching strategies. They will also complete an evaluation of the session.

References:
an analysis of the survey data will be shared, as well as feedback from fall 2017 and spring 2018 ASEE section meetings. Discussions will focus on how to improve member support and ASEE staff and board transparency.

**T596A - Non-tenure Track Faculty Leadership Roundtable**
3:15 p.m. - 4:45 p.m., Salon C, HQ Hotel - Marriott at City Creek
**Sponsors:** ASEE Headquarters; Biomedical Engineering Division; Engineering Technology Division; Multidisciplinary Engineering Division
**Moderators:** Rachel McCord, University of Tennessee, Knoxville; Jack Bringardner, NYU's Tandon School of Engineering
As part of ASEE's ongoing activities in support of a diverse and inclusive environment for all members, this is a working session for a special interest group (SIG) focusing on issues relevant to the community of faculty who are in non-tenure track positions. The purpose is to facilitate open dialogue and conversation, allowing participants to discuss how ASEE can support engineering education, relevant diversity research, and engagement of this community in society activities. A team of facilitators will help guide the discussion, and the output of the session will be a set of recommendations for consideration by ASEE's leadership for consideration and integration into the activities of the society.

**T596B - Graduate Students Leadership Roundtable**
3:15 p.m. - 4:45 p.m., Salon B, HQ Hotel - Marriott at City Creek
**Sponsors:** ASEE Headquarters; Cooperative and Experiential Education Division; Biomedical Engineering Division
Alexandra Strong, Olin University
Adam Kim, University of Nevada, Reno
As part of ASEE's ongoing activities in support of a diverse and inclusive environment for all members, this is a working session for a special interest group (SIG) focusing on issues relevant to the community of graduate students interested in engineering education. The purpose is to facilitate open dialogue and conversation, allowing participants to discuss how ASEE can support engineering education, relevant diversity research, and engagement of this community in society activities. A team of facilitators will help guide the discussion, and the output of the session will be a set of recommendations for consideration by ASEE's leadership for consideration and integration into the activities of the society.

**T605 - Chemical Engineering Division Business Meeting**
5:00 p.m. - 6:00 p.m., Room 150 E, Convention Center - Salt Palace
**Sponsor:** Chemical Engineering Division

**T606 - Civil Engineering Division Planning Meeting**
5:00 p.m. - 6:00 p.m., Room 253 A, Convention Center - Salt Palace
**Sponsor:** Civil Engineering Division
Planning meeting to develop session ideas and draft the call for papers for the 2019 Annual Conference. Anyone interested in helping to plan next year's Civil Engineering Division technical sessions is welcome to attend.

**T608 - ASEE Business Meeting**
5:00 p.m. - 6:00 p.m., Salon A, HQ Hotel - Marriott at City Creek
**Sponsor:** Computers in Education Division
This is the annual business meeting for the CoED Division. Officer elections will occur this year at this meeting.

**T609 - Business Meeting**
5:00 p.m. - 6:00 p.m., Room 252, Convention Center - Salt Palace
**Sponsor:** Construction Engineering Division
Free ticketed event

**T6100 - CMC Business Meeting**
5:00 p.m. - 6:00 p.m., Room 251 F, Convention Center - Salt Palace
**Sponsor:** Corporate Member Council

**T611 - CEED Business Meeting**
5:00 p.m. - 6:00 p.m., Room 251 C, Convention Center - Salt Palace
**Sponsor:** Cooperative and Experiential Education Division
This is the general business meeting for the Cooperative & Experiential Education Division. The meeting is open to all interested ASEE members.
Free ticketed event

**T6113 - Undergraduate Experience Committee: Business Meeting**
5:00 p.m. - 6:00 p.m., Room 250 A, Convention Center - Salt Palace
**Sponsor:** Undergraduate Experience Committee
Business meeting of the Undergraduate Experience Committee (subcommittee of EDC)

**T613 - DEED Business Meeting**
5:00 p.m. - 6:00 p.m., Room 251 A, Convention Center - Salt Palace
**Sponsor:** Design in Engineering Education Division

**T614 - ERM Business Meeting**
5:00 p.m. - 6:30 p.m., Room 253 B, Convention Center - Salt Palace
**Sponsor:** Educational Research and Methods Division
This is the annual Business meeting of the ERM Division. The meeting is an opportunity to hear reports, contribute to decisions by the ERM board, learn about future events of the division, and get involved in
# Conference Sessions

**Tuesday, June 26**

ERM activities.

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<td>5:00 p.m.</td>
<td><strong>T623 - ETD Business Meeting</strong></td>
<td>Engineering Technology Division</td>
<td>Room 150 D, Convention Center - Salt Palace</td>
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<tr>
<td>5:00 p.m.</td>
<td><strong>T625 - Environmental Engineering Division Business Meeting</strong></td>
<td>Environmental Engineering Division</td>
<td>Room 251 D, Convention Center - Salt Palace</td>
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<tr>
<td>5:00 p.m.</td>
<td><strong>T627 - First-Year Programs Division Business Meeting</strong></td>
<td>First-Year Programs Division</td>
<td>Room 250 E, Convention Center - Salt Palace</td>
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<tr>
<td>5:00 p.m.</td>
<td><strong>T628 - GSD 2018 Business Meeting</strong></td>
<td>Graduate Studies Division</td>
<td>Room 250 D, Convention Center - Salt Palace</td>
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<tr>
<td>5:00 p.m.</td>
<td><strong>T633 - PCEE Division Business Meeting</strong></td>
<td>Pre-College Engineering Education</td>
<td>Room 250 E, Convention Center - Salt Palace</td>
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<tr>
<td>5:00 p.m.</td>
<td><strong>T634 - LEES Business Meeting</strong></td>
<td>Liberal Education/Engineering &amp; Society Division</td>
<td>Room 250 F, Convention Center - Salt Palace</td>
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<td>5:00 p.m.</td>
<td><strong>T638 - ME Division Business Meeting</strong></td>
<td>Mechanical Engineering Division</td>
<td>Room 151 A, Convention Center - Salt Palace</td>
</tr>
<tr>
<td>5:00 p.m.</td>
<td><strong>T640 - MIND Business Meeting</strong></td>
<td>Minorities in Engineering Division</td>
<td>Room 251 E, Convention Center - Salt Palace</td>
</tr>
<tr>
<td>5:00 p.m.</td>
<td><strong>T649 - The Philosophy of Engineering and Technological Literacy Business Meeting</strong></td>
<td>Technological and Engineering Literacy/Philosophy of Engineering Division</td>
<td>Room 151 B, Convention Center - Salt Palace</td>
</tr>
<tr>
<td>5:00 p.m.</td>
<td><strong>T651 - Business Meeting</strong></td>
<td>Women in Engineering Division</td>
<td>Room 250 B, Convention Center - Salt Palace</td>
</tr>
<tr>
<td>5:00 p.m.</td>
<td><strong>T655 - Business Meeting - Engineering Leadership Development Division</strong></td>
<td>Engineering Leadership Development Division</td>
<td>Room 250 B, Convention Center - Salt Palace</td>
</tr>
<tr>
<td>5:00 p.m.</td>
<td><strong>T656 - Military and Veterans Division Business Meeting</strong></td>
<td>Military and Veterans Division</td>
<td>Room 257 A, Convention Center - Salt Palace</td>
</tr>
<tr>
<td>5:00 p.m.</td>
<td><strong>T696 - IUCEE Business Meeting</strong></td>
<td>ASEE Headquarters</td>
<td>Room 251 B, Convention Center - Salt Palace</td>
</tr>
<tr>
<td>7:00 p.m.</td>
<td><strong>T701 - Aerospace Division Wine and Dine</strong></td>
<td>Aerospace Division</td>
<td>South Foyer, Convention Center - Salt Palace</td>
</tr>
<tr>
<td>7:00 p.m.</td>
<td><strong>T706 - Civil Engineering Division Annual Awards Banquet</strong></td>
<td>Civil Engineering Division</td>
<td>Offsite, Natural History Museum of Utah, 301 Wakara Way, Salt Lake City, UT 84108</td>
</tr>
</tbody>
</table>

Schedule subject to change: Please go to [www.asee.org/icp](http://www.asee.org/icp) for up to date information
T709 - Social Event for the Construction and Architectural Divisions
6:00 p.m. - 8:00 p.m., Offsite, Location to be determined, Meet in the Lobby of Marriott City Creek
Sponsor: Construction Engineering Division
Ticketed event: $20.00 advanced registration and $30.00 on site registration

T7100 - INDUSTRY DAY: Institutional Council Reception Sponsored by NCEES (By Invitation Only)
7:00 p.m. - 9:00 p.m., Offsite, The Utah Science Technology and Research Building, The University of Utah, 36 S Wasatch Dr. Salt Lake City, UT 84112
Sponsors: Corporate Member Council; Engineering Deans Council; Engineering Research Council; Engineering Technology Council
This reception, hosted by the Engineering Deans Council, Corporate Member Council, Engineering Research Council, and Engineering Technology Council, is by invitation only.

T711 - CEED Social
6:30 p.m. - 8:30 p.m., Offsite, Caffé Molisse. CEED members and invited guests will be emailed the location and directions. Or stop by the CEED table at the Division Mixer on Sunday.
Sponsor: Cooperative and Experiential Education Division
Get to know your fellow CEED members at our evening social. The division will provide complimentary appetizers and drinks. This event will be held offsite at Caffé Molisse.
Free ticketed event

T713 - DEED Members Dinner
7:00 p.m. - 9:00 p.m., Offsite, Copper Onion, 111 E Broadway Ste 170 Salt Lake City, UT 84111 Downtown, Central City, Salt Lake City
Sponsor: Design in Engineering Education Division
Those interested in attending the dinner, please meet at the business meeting just before and we will walk to our dining location at the Copper Onion.

T714 - Educational Research and Methods (ERM) Brouhaha
7:00 p.m. - 9:00 p.m., Offsite, The Clark Planetarium is located in downtown Salt Lake City near the Convention Center and next to the TRAX Planetarium stop, and there will be plenty to see and do!
Sponsor: Educational Research and Methods Division
Join us for the ASEE ERM Brouhaha—our annual social gathering where you can catch up with old friends and make new connections. Our Brouhaha will be at the Clark Planetarium. Enjoy the ERM annual awards ceremony, meet this year’s Apprentice Faculty Grant awardees, and explore the Planetarium’s impressive meteorite collection. There will be a DJ playing music, and the dinner will be catered by one of Salt Lake City’s top caterers, LUX catering. Tickets are $75 if purchased in advance, and $85 at the door. We would appreciate early registrations, so that we can provide the caterer with accurate attendance information. We are looking forward to seeing you at this year’s Brouhaha!
Ticketed event: ERM - $75.00 advanced registration and $85.00 on site registration

T714B - FIE Executive Board
6:35 p.m. - 9:00 p.m., Room 253 B, Convention Center - Salt Palace
Sponsor: Educational Research and Methods Division
FIE executive board.

T715 - ECE Division Networking Dinner
7:00 p.m. - 9:00 p.m., Offsite, Trofi North Room, Spencer's for Steaks and Chops, Hilton Salt Lake City Center, 255 South West Temple, Salt Lake City, UT
Sponsor: Electrical and Computer Division
The ECE Division welcomes members and guests interested in all areas of electrical and computer engineering to come together for a social time and networking dinner. A full catered dinner is included with your ticket. Tickets are $25 in advance and $35 at the ECE Division Business Meeting. Cash bar available. Attendance is limited.
Ticketed event: $25.00 advanced registration and $35.00 on site registration

T716 - Division Dinner at Mazza Middle Eastern Cuisine
7:00 p.m. - 9:00 p.m., Offsite, 912 East 900 South, Salt Lake City, UT 84105, TBD
Sponsor: Energy Conversion and Conservation Division
For more information, please visit mazzacafe.com
The 209 bus travels between the convention center and Mazza. The bus will cost $2.50 out of pocket.
Ticketed event: $35.00 advanced registration and $45.00 on site registration

T718 - EDGD Awards Dinner and Social
6:30 p.m. - 9:00 p.m., Offsite, EM's Restaurant, 271 North Center Street, Salt Lake City, Utah
Sponsor: Engineering Design Graphics Division
Come join one of the most social and welcoming divisions within ASEE. Spend the evening with excellent food, entertaining conversion, and witty colleagues.
This awards dinner will also recognize the division’s Distinguished Service Award Winner, among other division awards.
The fare at EM’s is simple elegance. All items are prepared fresh by hand from local, organic ingredients.
Free ticketed event

T719 - Joint Banquet
6:15 p.m. - 9:15 p.m., Offsite, Silver Fork Lodge and Restaurant, Brighton, Utah
Sponsors: Engineering Economy Division; Engineering Management Division; Industrial Engineering Division; Systems Engineering Division
A joint social and awards dinner.
This year we will dine at the Silver Fork Lodge and Restaurant in Brighton, Utah. The event will have a cash bar, and the meal will allow...
a choice of prime rib, apple stuffed pork loin, or vegetarian lasagna. All meals are served with vegetable medley, bread, and choice of potato or rice.
Because of the location, we will be taking a bus (included in ticket price) or you may drive up to join us.
Ticketed event: $65.00 advanced registration and $75.00 on site registration

T721 - ELD Annual Banquet
6:00 p.m. - 9:00 p.m., Offsite, Located at 327 W 200 South about a block behind the Convention Center.
Sponsor: Engineering Libraries Division
Tickets to the banquet are free to registered ELD members because of the generous sponsorship of Elsevier. Tickets for guests are available for $100. Information about signing up for the banquet will be distributed via the ELD list-serve. Any questions can be directed to John Napp.

T724 - Entrepreneurship and Engineering Innovation Division ENT/KEEN Reception
7:00 p.m. - 9:00 p.m., Grand Ballroom I & J, Convention Center - Salt Palace
Sponsor: Entrepreneurship & Engineering Innovation Division

T725 - Environmental Engineering Division Social
7:00 p.m. - 9:00 p.m., Offsite, Brio Tuscan Grille, 80 South Regent Street, Salt Lake City, UT 84101. Five minute walk (0.2 miles) from the Salt Palace Convention Center.
Sponsor: Environmental Engineering Division
Pre-registration ticket $35, onsite ticket $45
Environmental Engineering Division Social at a local restaurant.
Ticketed event: $35.00 advanced registration and $45.00 on site registration

T726 - DELOS Business Meeting
7:00 p.m. - 9:00 p.m., Salon A, HQ Hotel - Marriott at City Creek
Sponsor: Experimentation and Laboratory-Oriented Studies Division
DELOS Business Meeting

T727 - First-Year Program Division Dinner & Social
6:30 p.m. - 8:30 p.m., Offsite, The University of Utah, Warnock Engineering Building (atrium)
Sponsor: First-Year Programs Division
Join the First-Year Programs Division members for a dinner and social.
Ticketed event: $30.00 advanced registration and $40.00 on site registration

T733 - MIND/PCEE/WIED Reception
7:00 p.m. - 9:00 p.m., Salon D, HQ Hotel - Marriott at City Creek
Sponsors: Pre-College Engineering Education Division; Minorities in Engineering Division; Women in Engineering Division
Join the Minorities in Engineering Division, Pre-College Engineering Education Division, and Women in Engineering for our annual social mixer.
Ticketed event: $25.00 advanced registration and $35.00 on site registration

T734 - LEES Reception and Dinner
7:00 p.m. - 9:00 p.m., Offsite, Good Grammar, 69 East Gallivan Ave., Salt Lake City, UT 84111
Sponsor: Liberal Education/Engineering & Society Division
Come eat, drink, and be merry with your LEES friends and colleagues. The division will provide appetizers and wine for the group, and you can certainly pay for additional food and beverages yourself if you wish. See you there! Good Grammar, 69 East Gallivan Ave., Salt Lake City, UT 84111

T735 - Manufacturing Division Social
6:00 p.m. - 9:00 p.m., Offsite, Cedars of Lebanon Restaurant, 152 E 200 S Salt Lake City, UT 84111
Sponsor: Manufacturing Division
This will be a dinner (ticketed) for division members and others who want to be affiliated.
Cedars of Lebanon Restaurant
152 E 200 S Salt Lake City, UT 84111
Head southeast on W Temple toward 200 S, Turn left onto 200 S, Destination will be on the right
11 Mins walk from Convention Center
cedarsoflebanonrestaurant.com
Ticketed event: $70 advanced registration and $80 on site registration

T736 - Materials Division Social
7:00 p.m. - 9:00 p.m., Salon H, HQ Hotel - Marriott at City Creek
Sponsor: Materials Division
We will be arranging transportation to a private residence for dinner. Please make sure to add the event to your schedule, and you will be sent additional information closer to the event.

T739 - Mechanics Division Awards Banquet
7:00 p.m. - 9:00 p.m., Offsite, Squatters Pub Brewery, 147 West BroadwaySalt Lake City, UT 84010
Sponsor: Mechanics Division
Enjoy a great meal with your mechanics colleagues, meet new fellow mechanics educators, and share in celebrating with award honorees for Best Paper at the 2018 conference and Best Presentation in 2017. All are welcome.

Invited Speaker:
Dr. Donald Bloswick
Emeritus Professor
The University of Utah
Ticketed event: $75.00 advanced registration and $85.00 on site registration
**Conference Sessions**

**Tuesday, June 26**

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**T742 - New Engineering Educators Division Social**
7:00 p.m. - 9:00 p.m., Offsite, The Garden Restaurant - Temple Square, 15 East South Temple

*Sponsor: New Engineering Educators Division*
Join us at The Garden at Temple Square to network and mingle with engineering educators. Everyone is welcome! Grad students, new professors, experienced professors – anyone involved with engineering student education.
Food and beverage not provided.
The Garden Restaurant - Temple Square
15 East South Temple
Free ticketed event

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**T747 - ASEE Student Chapters Meet and Greet**
7:00 p.m. - 9:00 p.m., Offsite, Blue Lemon, 55 S Temple, Salt Lake City

*Sponsor: Student Division*
The Student Division would like to offer an opportunity for our Collegiate Student Chapters to meet each other and exchange ideas. This event will be a casual opportunity for chapters to meet the Division Executive Board and exchange ideas on how best for us to work together and expand.

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**T756 - Military and Veterans Division Social**
7:00 p.m. - 9:00 p.m., Offsite, 140 S 300 W Unit #1
(801) 619-7009
https://ribandchophouse.com/locations/salt-lake-city/

*Sponsor: Military and Veterans Division*
Pay-as-you-go dinner
Free ticketed event
W196A - Sunrise Gentle Yoga
7:00 a.m. - 7:45 a.m., South Foyer, Convention Center - Salt Palace
Sponsor: ASEE Headquarters
Join your friends and colleagues as we jump-start our day with a renewing stretch and meditation class!
(Mats and exercise clothes are not required.)
Free ticketed event.

W193 - 2017/2018 Board of Directors Meeting
7:30 a.m. - 9:30 a.m., Salon E, HQ Hotel - Marriott at City Creek
Sponsor: ASEE Board of Directors

W101A - Bus Tour to Hill Aerospace Museum
7:30 a.m. - 12:30 p.m., Offsite, Hill Aerospace Museum, 7961 Wardleigh Rd.Bldg. 1955 Hill AFB, UT 84056-5842
Sponsor: Aerospace Division
The Aerospace Division intends to visit the Hill Aerospace Museum to encourage the conference participants in exploring artifacts and advancements in the aerospace field. The tour will be ticketed.
Ticketed event: $20.00 advanced registration and $25.00 on-site registration
Student Ticket for Aerospace Division Bus Tour - $10.00 advanced registration and $15.00 on-site registration

W196C - ASEE Registration Open
8:00 a.m. - 3:00 p.m., Exhibit Hall Foyer, Convention Center - Salt Palace
Sponsor: ASEE Headquarters

W196B - ASEE’s Living Wall
8:00 a.m. - 4:00 p.m., Exhibit Hall Foyer, Convention Center - Salt Palace
Sponsor: ASEE Headquarters
We’re excited to bring back the ASEE Living Wall to the Annual Conference this year! Each year at the conference, attendees will contribute their thoughts to the wall by writing a response to a particular question or idea. The wall will be preserved and displayed from year to year, growing bigger and bigger, and serving as a historical document of our conference attendees’ insights, ruminations, and reflections. We hope you’ll take a few moments to leave your legacy on the Living Wall, located near the Exhibit Hall.

W104 - Active learning in BME, Session II
8:00 a.m. - 9:30 a.m., Room 155 D, Convention Center - Salt Palace
Sponsor: Biomedical Engineering Division
Moderator: Naji Husseini, North Carolina State University
New initiatives involving active learning and flipped lectures in BME courses.

Benefits of Active Learning Embedded in Online Content Material Supporting a Flipped Classroom
Dr. Jean-Michel I. Maarek, University of Southern California
The Impact of Integrating a Flipped Lecture in a Biotransport Laboratory Course on Student Learning and Engagement
Asem Farooq Aboelzahab, Purdue University, West Lafayette

W105 - Works-in-Progress Postcard Session
8:00 a.m. - 9:30 a.m., Room 151 F, Convention Center - Salt Palace
Sponsor: Chemical Engineering Division
Moderator: Cheryl Bodnar, Rowan University
This special-format session gives authors of works-in-progress papers the opportunity to present a two-slide overview of their work in five minutes or less. After these lightning talks, attendees will have the opportunity to talk with authors, allowing for feedback and discussion in greater detail.

Exploring Mind Maps for Assessment in an Introductory Chemical Engineering Course
Prof. Joshua A Enszer, University of Delaware
Ten Years in the Trenches: An Updated Suite of Scenario-based Academic Integrity Videos
Dr. Adam T. Melvin, Louisiana State University
Dr. Lisa G. Bullard, North Carolina State University
Work in Progress: Identifying Current Standards and Addressing the Need for Further Process Safety Education in Unit Operations Courses
Ms. Tracy L. Carter, Northeastern University
Prof. Samira M. Azarin, University of Minnesota, Twin Cities
Dr. Janie Brennan, Washington University, St. Louis
Prof. Elizabeth Hill, University of Minnesota, Duluth
Amy J. Karlsson, University of Maryland, College Park

Work in Progress: Development of Web-based Pre-laboratory Modules to Increase Motivation and Reduce Cognitive Load
Kimia Moozeh, University of Toronto
Prof. Deborah Tiwani, University of Toronto
Prof. Jennifer Lynn Farmer, University of Toronto
Dr. Greg Evans, University of Toronto

Work in Progress: Transforming a Course
Dr. Polly R. Piovogian, Lafayette College

Work in Progress: Content Validation of an Engineering Process Safety Decision-making Instrument (EPSRI)
Brittany Lynn Butler
Dr. Daniel D. Anastasio, Rose-Hulman Institute of Technology

Schedule subject to change: Please go to www.asee.org/icp for up to date information
Wednesday, June 27

Conference Sessions

W106 - Fostering Business and Professional Skills in the Engineering Classroom
8:00 a.m. - 9:30 a.m., Room 255 C, Convention Center - Salt Palace
Sponsor: Civil Engineering Division
Moderators: Mohammad Uddin, East Tennessee State University; Matthew Lovell, Rose-Hulman Institute of Technology

- Developing an Understanding of Civil Engineering Practitioner Problem-solving Rationale Using Multiple Contextual Representations
  - Mr. Sean Lyle Gestson, Oregon State University
  - Mr. Benjamin David Lutz, Oregon State University
  - Dr. Shane A. Brown P.E., Oregon State University
  - Dr. Matthew Stephen Barner, Oregon State University
  - Dr. David S. Hurwitz, Oregon State University
  - Mr. Masoud Ghodrat Abadi, Oregon State University

- Leadership for Engineers: A Course for Developing Professional and Business Skills for Engineers
  - Dr. Decker B. Hains, Western Michigan University
  - Dr. Bret J. Wagner, Western Michigan University

- Contributions of Industry Involvement in Civil and Environmental Engineering Capstone Design Projects
  - Dr. Ashraf Badir P.E., Florida Gulf Coast University
  - Dr. Long Duy Nguyen P.E., Florida Gulf Coast University
  - Dr. Robert O'Neill P.E., Florida Gulf Coast University
  - Prof. Kristoph-Dietrich Kinzli, Colorado School of Mines
  - Dr. Simeon J. Komisar, Florida Gulf Coast University
  - Dr. Jong-Yeop Kim, Florida Gulf Coast University

- Understanding the Expectations of Writing Skills in Engineering Design Courses and Professional Practice
  - Dr. Veera Gnaneswar Gude P.E., Mississippi State University

- Utilizing Reflective Practice to Develop Agency in Goal Setting and Achievement in Workplace Learning Environments
  - Dr. Andrea Goncher, Charles Sturt University

This session will highlight COED submitted papers that are related to mechanical engineering or have mechanical engineering themes. Use of Computer Coding to Teach Design in a Mechanics Course, Resulting in an Implementation of a Kinematic Mechanism Design Tool Using PYTHON
  - Dr. Peter L. Schmidt PE, University of Evansville
  - Mr. Philip Andrew Lax, University Of Evansville

A Low-cost Affordable Viscometer Design for Experimental Fluid Viscosity Verification and Drag Coefficient Calculation
  - Mr. Joseph Michael Derrick, Indiana University-Purdue University of Indianapolis
  - Mr. Michael Golub, Indiana University-Purdue University of Indianapolis
  - Mr. Vaibhav R. Shrivastav
  - Dr. Jing Zhang, Indiana University-Purdue University of Indianapolis

Library and Student Innovation Center: Makerspace!
  - Dr. Steven F. Barrett, University of Wyoming
  - Dr. Tonia A. Dousay, University of Idaho
  - Tyler J. Kerr, University of Wyoming
  - Mr. Larry Schmidt, University of Wyoming
  - Mr. Brandon Seth Gellis, University of Wyoming
  - Jesse Ballard, University of Wyoming

Implementation of a 3D Interactive Mobile App for Practicing Engineering Laboratory Experiment
  - Mr. Shuo Ren, Old Dominion University
  - Mr. Zelin Zhu, Old Dominion University
  - Dr. Rick McKenzie, Old Dominion University
  - Prof. Yuzhong Shen, Old Dominion University

Conceptual Framework for Integrating a Wireless Sensor and Control Network into a Robotics Course for Senior Students of Mechanical Engineering Technology
  - Dr. Zhou Zhang, New York City College of Technology
  - Dr. Andy S. Zhang, New York City College of Technology
  - Dr. Mingshao Zhang, Southern Illinois University, Edwardsville
  - Dr. Sven K. Esche, Stevens Institute of Technology

W1112A - Revealing the Invisible: Engineering Course Activities that Address Privilege, -Isms, and Power Relations (Interactive Session)
8:00 a.m. - 9:30 a.m., Room 150 F, Convention Center - Salt Palace
Sponsors: ASEE Diversity Committee; Faculty Development Constituency Committee; Design in Engineering Education Division; Liberal Education/Engineering & Society Division; International Division; Minorities in Engineering Division
Speakers: Dr. Odesma Onika Dalrymple, University of San Diego; Dr. Susan M Lord, University of San Diego; Diana Chen, University of San Diego; Dr. Joel Alejandro Mejia, University of San Diego

Privilege is often not recognizable by those who benefit from the consequential unearned advantages (McIntosh, 2010). Undetected, this “invisible knapsack,” as defined by Peggy McIntosh, perpetuates through intergenerational inheritance, normalizing the resulting inequities. In the United States there are entrenched notions of superiority and
inferiority tied to many socially constructed identities such as race, ethnicity, gender, and socio-economic status. The subsequent hierarchies place whiteness, European traditions, masculinity and middle-to-high socioeconomic status at the top, entitling those who can assume these descriptors and disadvantaging those who cannot. The engineering profession, inclusive of the higher-education system that facilitates the training of its practitioners, is often portrayed as an “enterprise in which power relations play no part, [and access is] based solely on meritocratic judgments about eligibility and skill” (Slaton, 2015, p. 171). However, as we review the engineering population, both past and present, critically examining the identities of those who benefit most from its achievements, those who comprise its membership, and those whose cultural norms and values are most reflected in its epistemologies; the presence of an invisible knapsack becomes apparent (Baillie, Pawley, and Riley, 2012; Bix, 2000, 2004; Douglas, 2015; Riley, 2008; Slaton, 2010, 2013, 2015). This knapsack, curated over many generations, under the guise of maintaining rigor, bestows the greatest advantages on white, able-bodied males from middle-high socioeconomic status. Consequently, as is most reflected in the limited diversity among engineering professionals, faculty, and students; people from minority populations, and all women in general, experience the greatest disadvantages in participating in, shaping, or influencing the nature of engineering practice in the United States.

At a small, private, liberal arts university, as part of a National Science Foundation Revolutionizing Engineering and Computer Science Departments (RED) grant, a team of faculty are working on moving from teaching engineering as a purely technical endeavor to a sociotechnical endeavor. One important aspect of helping students understand the sociotechnical nature of engineering involves exploring privilege, both within the discipline and within the societal structure where it is practiced. In this interactive session, the facilitators will invite participants to engage in a subset of activities that have been used in two engineering courses (i.e., User-centered Design and Engineering and Social Justice) to help students learn about privilege; its relationship to different -isms, such as racism, sexism, classism, ableism, and heterosexism; and the role engineering plays / can play in reinforcing or dismantling that privilege.

The facilitators will share their experiences and lessons learned in using these activities with engineering students and invite participants to share their insights based on their participation in the session. The session will also consist of an open discussion around challenges in integrating content around privilege, -isms, and power relations in other engineering courses, and strategies to overcome these challenges. Session activities will be drawn from the following two engineering courses:

- **User Centered Design**—a required course for all first- or second-year engineering majors which introduces students to strategies for first identifying the needs, capabilities, and behaviors of a user and developing designs to accommodate those needs.
- **Engineering and Social Justice**—a junior-level required course for General Engineering majors that is designed to help students use critical literacy practices to analyze the historical, social, political, and economic impacts of engineering in marginalized communities. Students also consider the contemporary contexts and impacts of the designs, systems, processes, and products surrounding and involving engineering and engineers.

### Revealing the Invisible: Conversations about -isms and Power Relations in Engineering Courses

**Speakers:**
- Joel Alejandro Mejia, University of San Diego
- Dr. Diana A. Chen, University of San Diego
- Dr. Odesma Onika Dalrymple, University of San Diego
- Dr. Susan M Lord, University of San Diego

**Session Details:**
- **Date:** Wednesday, June 27
- **Time:** 8:00 a.m. - 9:30 a.m.
- **Location:** Room 155 C, Convention Center - Salt Palace
- **Sponsor:** Design in Engineering Education Division

**Session Activities Will Be Drawn From:**
- An Introductory Design and Communication Course Intended for All Engineering Majors Takes It to the Farm
  - Dr. Jennifer S. Mullin, University of California, Davis
  - Prof. Jean S. VanderGheynst, University of California, Davis
- An Evaluation of an Engineering Design Class using Mixed Methods Techniques
  - Ms. Martina Margaret Moynie, University College Dublin
  - Mr. Maxwell Herman, Harvard University
  - Prof. Conor Walsh P.E., Harvard University
  - Dr. Donald Padua Holland, University College Dublin
- Differences and Similarities in Student, Instructor, and Professional Perceptions of ‘Good Engineering Design’ Through Adaptive Comparative Judgment
  - Dr. Scott R. Bartholomew, Purdue Polytechnic Institute
  - Dr. Greg J. Strimel, Purdue Polytechnic Institute
  - Dr. Senay Purzer, Purdue University, West Lafayette
  - Liwei Zhang, Purdue University, West Lafayette
  - Emily Yoshikawa, Purdue University, West Lafayette
- Customer Review-driven Function Formulation for Design Education
  - Dr. Ang Liu, University of New South Wales
  - Mr. Yuchen Wang, University of New South Wales
  - Dr. Yun Dai, University of Southern California
- Development and Implementation of a Longitudinal Design Assessment
  - Dr. John Crepeau P.E., University of Idaho, Moscow
  - Michael Maughan, University of Idaho, Moscow
  - Mr. Dan Corden, University of Idaho, Moscow
  - Dr. Steven W. Beyerlein, University of Idaho, Moscow
  - Dr. Matthew John Swenson P.E., University of Idaho, Moscow
  - Dr. Daniel J. Robertson, University of Idaho, Moscow
  - Dr. Sean Michael Quallen, University of Idaho, Moscow

### W114A - Active Learning Methods in Action

**Speaker:**
- Dr. Scott R. Bartholomew, Purdue Polytechnic Institute

**Session Details:**
- **Date:** Wednesday, June 27
- **Time:** 8:00 a.m. - 9:30 a.m.
- **Location:** Room 155 B, Convention Center - Salt Palace
- **Sponsor:** Educational Research and Methods Division

**Moderators:**
- Vimal Viswanathan, San Jose State University
- Robert DeMonbrun, University of Michigan

**Educational Research and Methods Division Technical Session Active Learning Model as a Way to Prepare Students for..."
Knowledge Integration
Dr. Sourajee Roy, Colorado State University
Prof. Branislav M. Notaros, Colorado State University
Prof. Ali Pezeshki, Colorado State University
Prof. Tom Chen, Colorado State University
Dr. Thomas J. Siller, Colorado State University
Dr. Anthony A. Maciejewski, Colorado State University
Dr. Laura B. Sample McMeeking, Colorado State University

Pedagogical Effectiveness of Classroom Demonstrations Devices
Dr. Tom McCormick, Virginia Military Institute
Dr. James C. Squire, Virginia Military Institute
Prof. Gerald Sullivan P.E., Virginia Military Institute

Dissemination of Active Learning Tools for Software V&V
Education and Their Pedagogical Assessment
Dr. Priya A. Manohar, Robert Morris University
Dr. Sushil Acharya, Robert Morris University
Prof. Peter Y. Wu, Robert Morris University
Dr. Mary A. Hansen, Robert Morris University

Using a Paper-based Supply Chain Game to Enhance Student Learning
Mr. Scott Abney, East Carolina University
Dr. Mark Angolia, East Carolina University
Dr. Leslie Fugliari, East Carolina University

All Games Are Not Created Equally: How Different Games Contribute to Learning Differently in Engineering
Mr. John Ray Morelock, Virginia Tech
Katie A. Shoemaker, University of Michigan
Dr. Lisa R. Lattuca, University of Michigan

Moving Beyond "Does Active Learning Work?" with the Engineering Learning Observation Protocol (ELCOT)
Dr. Megan Sanders, Colorado School of Mines
Dr. Sam Spiegel, Colorado School of Mines
Dr. Jennifer Zoltners Sherer, University of Pittsburgh

W114B - Career Decisions and Faculty Development
8:00 a.m. - 9:30 a.m., Room 151 G, Convention Center - Salt Palace
Sponsor: Educational Research and Methods Division
Moderators: Katherine Ehler, Clemson University; Natascha Buswell, University of California, Irvine
Educational Research and Methods Division technical session.
Understanding the Socializer Influence on Engineering Students’ Career Planning
Rohini Abhyankar, Arizona State University
Dr. Cheryl Carrico P.E., Virginia Tech
Dr. Holly M. Matusovich, Virginia Tech
Dr. Samantha Ruth Brunhaver, Arizona State University

Early-career Plans in Engineering: Insights from the Theory of Planned Behavior
Trevion S. Henderson, University of Michigan
Katie A. Shoemaker, University of Michigan
Dr. Lisa R. Lattuca, University of Michigan

To Map or to Model: Evaluating Dynamism in Organically Evolving Faculty Development

W114C - Institutional Change
8:00 a.m. - 9:30 a.m., Room 260 A, Convention Center - Salt Palace
Sponsor: Educational Research and Methods Division
Moderators: Gary Lichtenstein, Arizona State University; Jaqi McNeil, University of Louisville
Educational Research and Methods Division technical session.
A Model for Spurring Organizational Change Based on Faculty Experiences Working Together to Implement Problem-based Learning
Dr. Stephen Secules, University of Georgia
Mr. James John Bale Jr., University of Georgia
Dr. Nicola W. Sochacka, University of Georgia
Dr. Joachim Walther, University of Georgia
Transforming an Institution by Engineering Learning
Dr. Sam Spiegel, Colorado School of Mines
Dr. Megan Sanders, Colorado School of Mines
Dr. Jennifer Zoltners Sherer, University of Pittsburgh

Work in Progress: Ways of Thinking of Interdisciplinary Collaborators
Ms. Medha Dalal, Arizona State University
Dr. Adam R. Carberry, Arizona State University

Work in Progress: Undergraduate Socialization in Engineering: The Role of Institutional Tactics and Proactive Behaviors
Trevion S. Henderson, University of Michigan
Dr. Cynthia J. Finelli, University of Michigan

W115 - Electrical and Computer Division
Technical Session 7
8:00 a.m. - 9:30 a.m., Room 255 B, Convention Center - Salt Palace
Sponsor: Electrical and Computer Division
Moderator: John Post, Embry-Riddle Aeronautical University, Prescott
Lessons Learned from a Radio Spectrum Coexistence Competition: A Road Map to Engagement in Informal Education of Wireless Communication
Mr. Joshua Alexéi García Sheridan, Virginia Tech
Dr. Richard M. Goff, Virginia Tech
Dr. Seungmo Kim, Georgia Southern University
Dr. Vuk Marojevic, Virginia Tech
Dr. Nicholas F. Polys, Virginia Tech
Dr. Carl B. Dietrich, Virginia Tech
Design of Experiment in a Junior-level RF Systems Lab
Conference Sessions

**Wednesday, June 27**

**W120 - Engineering Ethics Division Technical Session 4**
8:00 a.m. - 9:30 a.m., Room 155 F, Convention Center - Salt Palace

**Sponsor:** Engineering Ethics Division

**Moderators:** Dean Nieusma, Rensselaer Polytechnic Institute; Indira Nair, Carnegie Mellon University

**Framing Engineering Ethics Education with Pragmatism and Care: A Proposal**
- Dr. Indira Nair, Carnegie Mellon University
- Dr. William M. Bulleit, Michigan Technological University

**Toward a More Caring Code of Engineering Ethics**
- Dr. Elisa Warford, University of Southern California

**Identifying Moral Foundations and Disciplinary Frameworks of Engineering Ethics**
- Dr. Jonathan Beever, University of Central Florida
- Dr. Laurie A. Pinkert, University of Central Florida

**Ethics Education as Enculturation: Student Learning of Personal, Social, and Professional Responsibility**
- Dr. Dean Nieusma, Rensselaer Polytechnic Institute
- Mitch Cieminski, Rensselaer Polytechnic Institute

**Investigating Influences on First-year Engineering Students’ Views of Ethics and Social Responsibility**
- Ms. Swetha Nittala, Purdue University, West Lafayette
- Tisha Zephirin, Purdue University, West Lafayette
- Ms. Shiloh M. James Howland, Brigham Young University
- Miss Dayoung Kim, Purdue University, West Lafayette
- Mr. Andrew Katz, Purdue University, West Lafayette
- Prof. Brent K. Jesiek, Purdue University, West Lafayette

**Beyond Our Horizon: Reaching out to Engineering Faculty to Teach Spatial Literacy**
- Sylvia George-Williams, Southern Methodist University
- Jessie Marshall Zarazaga, Southern Methodist University

**How to Be a Subject Specialist When You Aren’t: Engineering Librarianship for the Non-engineer**
- Ms. Crystal L. Renfro, Kennesaw State University
- Ms. Lori J. Ostapowicz Critz, Worcester Polytechnic Institute

**Project Shhh! A Library Design Contest for Engineering Students**
- Lindsay Anderberg, New York University
- Dr. Matthew Frenkel, New York University
- Mr. Mikolaj Wilk, New York University

**Engineering Information for Non-engineers: A Case Study in Interdisciplinary Application of the ACRL Framework**
- Chelsea Leachman, Washington State University

**W122 - Course Tools and Practices**
8:00 a.m. - 9:30 a.m., Room 253 B, Convention Center - Salt Palace

**Sponsor:** Engineering Management Division

**Moderator:** Elizabeth Cudney, Missouri University of Science & Technology

**Work in Progress: Impact of Exposure to Broad Engineering on Student Perceptions**
- Kellie Grasman, Missouri University of Science & Technology
- Ms. Julie Phelps, Missouri University of Science & Technology

**A Retention Model for Community College STEM Students**
- Jennifer Snyder, Valencia College
- Dr. Elizabeth A. Cudney, Missouri University of Science & Technology

**Implementing Lean Practices in an Academic Department: A Case Study**
- Dr. Ekaterina Koronyslova, South Dakota State University
- Dr. Carrie Steinlicht, South Dakota State University
- Dr. Teresa J.K. Hall, South Dakota State University
- Dr. Albena Yuliyanova Yordanova, South Dakota State University
- Prof. Byron G. Garry, South Dakota State University

**Lessons Learned from Implementing a Textbook’s Companion Website into a Production Operations Management Course**
- Lt. Col. John P Richards P.E., United States Military Academy

**Tools for Creating and Managing Student Teams**
- Dr. Eric M. Rice, Johns Hopkins University
- Dr. William Smedick, Johns Hopkins University

**W123 - MET and Mechatronics**
8:00 a.m. - 9:30 a.m., Room 151 C, Convention Center - Salt Palace

**Sponsor:** Engineering Technology Division

**Moderators:** Keith Johnson, East Tennessee State University; Byron Garry, South Dakota State University
Conference Sessions

Wednesday, June 27

Course Learning Evaluation in MET Using MATLAB GUIs for Low-stake Assignment Feedback of Graphical Solutions
Dr. M. Austin Creasy, Purdue Polytechnic Institute

Design of a Transparent Hydraulic/Pneumatic Excavator Arm for Teaching and Outreach Activities
Mr. Keith Scott Pate, University of Southern Indiana
Mr. Joseph David Marx
Prof. Abdallah A. Chehade
Prof. Farid Breidi, University of Southern Indiana

Mechatronics and Academic Success: Toward Understanding the Impacts of Age, Major, and Technical Experience
Dr. John R. Haughery, Iowa State University

Planning of Curriculum Modules for Teaching of Fluid Power Concepts
Dr. Jorge Rodriguez P.E., Western Michigan University
Dr. Alamgir A. Choudhury, Western Michigan University

Tensile Comparison of Polymer Specimens Produced with Different Processes
Dr. Wei Dai Vian, Purdue University, West Lafayette
Prof. Nancy L. Denton P.E., Purdue University, West Lafayette

W123B - ET Peripherals
8:00 a.m. - 9:30 a.m., Room 150 E, Convention Center - Salt Palace
Sponsor: Engineering Technology Division
Moderators: Christopher Leblanc, University of New Hampshire; Claudio Brito, Science and Education Research Council

Motivating STEM Participation through a ‘Making as Micro-manufacture (M3)’ Model
Mr. Osazuwa John Okundaye Jr, Texas A&M University
Dr. Mathew Kuttolamadom, Texas A&M University
Dr. Malini Natarajarathinam, Texas A&M University
Dr. Sharon Lynn Chu, Texas A&M University
Prof. Francis Quek, Texas A&M University

STEM Educators: Who Are They?
Dr. Anne M. Lucietto, Purdue Polytechnic Institute
Liza Ann Russell, Purdue University

Hands Across the Sea: Lessons Learned from the U.S. Fulbright Scholar Experience in the State of Qatar
Dr. Nasser Alaraje, Michigan Technological University
Dr. Mohammed Sayer Elaraj, Alaqsa University

International Experience of Engineering Technology Students Learning About Renewable Energy
Dr. Anne M. Lucietto, Purdue Polytechnic Institute

W124 - Entrepreneurship & Engineering Innovation Division Technical Session 8
8:00 a.m. - 9:30 a.m., Room 257 A, Convention Center - Salt Palace
Sponsor: Entrepreneurship & Engineering Innovation Division
Moderators: Sarah Grigg, Clemson University; David Novick, University of Texas, El Paso

Implementing the Tech Startup Model: A Retrospective on Year One

Dr. Kevin Buffardi, California State University, Chico
William Zamora, California State University, Chico
Dr. Colleen Robb, California State University, Chico
David Rahn, California State University, Chico

A Methodology to Involve Students in the Evaluation of an Engineering Curriculum in Design, Entrepreneurship, and Innovation
Miss Isabel Hilliger P.E., Pontificia Universidad Católica de Chile
Dr. Constanza Miranda Mendoza, Pontificia Universidad Católica de Chile
Dr. Mar Pérez-Sanagustín, Pontificia Universidad Católica de Chile

Maintaining Excellence in Undergraduate Education: The Faculty Development Seminars of the Baylor University School of Engineering & Computer Science (ECS) Over the Past Six Years
Ms. Cynthia C. Fry, Baylor University
Dr. Kenneth W. Van Treuren, Baylor University

Using Business Entrepreneurship Practices to Engage Middle School Students in STEM Learning: Three Years’ Perspective
Dr. Jidong Huang, California State University, Fullerton

Using the Design Thinking Approach to Develop an Entrepreneurial Development Center
Dr. Pradeep Kashinath Waychal, Western Michigan University
Prof. Vinit Kishor Agham
Mr. Vediyaa Sitaram Raghuvanshi, R. C. Patel Institute of Technology, Shirpur
Prof. Jayantrao Bhaurao Patil, R. C. Patel Institute of Technology, Shirpur
Dr. Pramod Jagann Deore

W127 - First-year Programs Division Postcard Session 2: Identity and Sense of Belonging
8:00 a.m. - 9:30 a.m., Room 254 B, Convention Center - Salt Palace
Sponsor: First-year Programs Division
Moderators: Joshua Gargac, University of Mount Union; Susan Freeman, Northeastern University

Seven mini-presentations followed by interactive discussions with individual authors of work-in-progress papers related to engineering identity and senses of belonging.

Work in Progress: Baseline Survey about Community and Identity
Abigail M. Clark, Ohio State University
Dr. Rachel Louis Kajfez, Ohio State University
Dr. Mahnas Jean Mohammadi-Aragh, Mississippi State University

Work in Progress: Engineers from Day One
Dr. Tirupalavanam G. Ganesh, Arizona State University
Dr. Kyle D. Squires, Arizona State University
Dr. James Collofello, Arizona State University
Ms. Robin R. Hammond, Arizona State University

Work in Progress: Leveraging the Diverse Backgrounds of Community College Students to Teach Team-based, Multidisciplinary Engineering

Schedule subject to change: Please go to www.asee.org/icp for up to date information
**Conference Sessions**

**Wednesday, June 27**

**Dr. David R. Ely**, Ivy Tech Community College, Lafayette  
**Mr. Jason E. Bice**, Purdue University, West Lafayette  
**Dr. Kendra A. Erk**, Purdue University, West Lafayette  

**Work in Progress: Students’ Reflection Quality and Effective Team Membership**  
**Ms. Saira Anwar**, Purdue University, West Lafayette  
**Dr. Muhsin Menekse**, Purdue University, West Lafayette  
**Miss Damji Heo**, Purdue University, West Lafayette  
**Miss Dayoung Kim**, Purdue University, West Lafayette  

**Work in Progress: Common Reading Experience: Assessing the Impact on Perceptions, Identity, and Belonging Among First-year Engineering Students**  
**Dr. Laura Hirshfield**, University of Michigan  
**Mr. Michael Dailey**, University of Michigan  
**Stacie Edington**, University of Michigan  

**Growing Character Strengths Across Boundaries**  
**Dr. Peter Golding**, University of Texas, El Paso  
**Celena Arreola**, University of Texas, El Paso  
**Mr. Mike Thomas Pitcher**, University of Texas, El Paso  
**Miss Crystal Fernandez-Pena**, University of Texas, El Paso  
**Mrs. Helen Elizabeth Geller**, University of Texas, El Paso  
**Ms. Giselle Andrade**, STEMGrow  
**Prof. Diane Elisa Golding**, University of Texas, El Paso  
**Mr. Randy Hazael Anaya**, University of Texas, El Paso  
**Hector Erick Lugo Nevarez**, University of Texas, El Paso  
**Mr. Pedro Arturo Espinoza**, University of Texas, El Paso  
**Mr. Hugo Gomez**, University of Texas, El Paso  
**Mrs. Herminia Hemmitt**, University of Texas, El Paso  
**Ms. Melissa Stearns**

**Investigation of Sense of Belonging to Engineering in Undergraduate Introductory Classes**  
**Dr. Sura Al-Qudah**, Western Washington University  
**Ms. Jill Davishahl**, Bellingham Technical College  
**Mr. Eric Davishahl**, Whatcom Community College  
**Michael Andrew Greiner**

**Aksense: A General-purpose Wireless Controlling and Monitoring Device for Teaching First-year Electrical and Computer Engineering**  
**Dr. Farid Farahmand**, Sonoma State University  
**Mr. David Andrew Story**, Sonoma State University  
**Mr. David Anthony House**, Sonoma State University  
**Mr. Robert Evan Rowlands**, Gap Wireless

**W127B - First-year Programs Division Postcard Session 1: Retention and Student Success Strategies**  
8:00 a.m. - 9:30 a.m., Room 254 A, Convention Center - Salt Palace  
**Sponsor: First-Year Programs Division**  
**Moderators: Benjamin Mertz, Arizona State University; Tamara Knott, Virginia Tech**

Eight mini-presentations followed by interactive discussions with individual authors of work-in-progress papers related to retention and student success strategies.  

**Work in Progress: Developing a Model for Student-led Peer Mentorship Programs**  
**Dr. Krystal S. Corbett**, Louisiana Tech University  
**Dr. Katie Evans**, Louisiana Tech University  
**Dr. Stacey McAdams**  
**Julie Gaudin**  
**Madison Abigail Walker**, Society of Women Engineers  
**Mr. Tyler Scott Fontenot**

**Work in Progress: Online Training in Spatial Reasoning for First-year Female Engineering Students**  
**Dr. Suzanne Zurn-Birkhimer**, Purdue University, West Lafayette  
**Ing. Mayari Illarij Serrano Anazco**, Purdue Polytechnic Institute  
**Dr. Beth M. Holloway**, Purdue University, West Lafayette  
**Rachel Ann Baker**, Purdue University, West Lafayette

**Work in Progress: Institutional Context and the Implementation of the Redshirt in Engineering Model at Six Universities**  
**Dr. Emily Knaphus-Soran**, University of Washington  
**Ms. Ann Delaney**, Boise State University  
**Ms. Katherine Christine Tetrick**, Washington State University  
**Ms. Sonya Cunningham**, University of Washington  
**Prof. Pamela Cosman**, University of California, San Diego  
**Ms. Tanya D. Ennis**, University of Colorado, Boulder  
**Dr. Beth A. Myers**, University of Colorado, Boulder  
**Dr. Jana Milford**, University of Colorado, Boulder  
**Dr. Donna C. Llewellyn**, Boise State University  
**Prof. Eve A. Riskin**, University of Washington  
**Dr. Janet Callahan**, Boise State University  
**Kevin O’Connor**, University of Colorado, Boulder  
**Dr. John B. Schneider**, Washington State University  
**Prof. Kevin Pitts**, University of Illinois, Urbana-Champaign  
**Dr. Michelle Ferrez**, University of California, San Diego

**Identifying At-risk Freshmen and Providing Enhanced Advising Support Through Intrusive Academic Advising Interventions**  
**Mr. Jeremy C. Helm**, Arizona State University  
**Ms. Tami Coronella**, Arizona State University  
**Mr. Tim Rooney**, Arizona State University

**Work in Progress: Strategic, Translational Retention Initiatives to Promote Engineering Success**  
**Dr. Elizabeth Anne Stephan**, Clemson University  
**Laurel Whisler**, Clemson University  
**Ms. Abigail T. Stephan**, Clemson University

**Work in Progress: Modeling a Tutoring Center to Improve Retention and Promote Student Success in Lower-level Engineering Classes**  
**Dr. Hadil Mustafa**, California State University, Chico  
**Assessing the Impact of Peer Mentoring on Performance in a Fundamentals of Engineering Course**  
**Qudsia Tahmina, Ohio State University at Marion**

**Work in Progress: Redesigning Curriculum to Foster Student Success**  
**Dr. Krystal S. Corbett**, Louisiana Tech University  
**Work in Progress: Assessing the Impact of the First-year Summer
Experience Program on Engineering Student Development and Transfer into Engineering
Dr. Elizabeth R. Kurban, University of Maryland, College Park
Dr. Paige E. Smith, University of Maryland, College Park
Kurubel Belay, University of Maryland

W132A - International Collaborations
8:00 a.m. - 9:30 a.m., Room 151 B, Convention Center - Salt Palace
Sponsor: International Division
Moderators: Wael Abdulmajeed, University of Baghdad; Pradeep Waychal, Western Michigan University

Assessment of a Peer Mentoring Program to Build Capacity for Course Development and Delivery
Dr. Steven J. Burian, University of Utah
Dr. Mercedes Ward, University of Utah
Prof. Sajjaid Ahmad, University of Nevada, Las Vegas
David Lawrence Stevenson
Prof. Timothy K. Gates, Colorado State University
Prof. Tariq Banuri, University of Utah
Prof. Muhammad Aslam Chaudhry, University of Utah
Dr. Rasool Bux Mahar P.E., Mehran University, Jamshoro
Prof. Jeffrey D. Ullman, Stanford University

Some Challenges to Building STEM Capacity in Emerging Economies: The Case of Namibia
Dr. Gary Bruce Gehrig P.E., University of North Carolina, Charlotte

Teaching in a Foreign Land: Experiences of International Teaching Assistants in U.S. Engineering Classrooms
Mr. Ashish Agrawal, Virginia Tech
Dr. Lisa D. McNair, Virginia Tech
Dr. Marie C. Paretti, Virginia Tech

What Should be Taught in Engineering Ethics Education Under Globalization?: Based on the Comparative Analysis of University Textbooks in China and the United States
Miss Jiaoqian Fu, Beihang University
Prof. Qing Lei, Beihang University
Dr. Deborah M. Grzybowski, Ohio State University
Prof. Dongya Cheng, Tibet University

After-action Review of a U.S.-based M.S. Degree Program Delivered in Kilimanjaro, Africa: Challenges and Opportunities for Future Consideration
Dr. Mitchell L. Springer, Purdue University, West Lafayette
Dr. Kari Clase, Purdue University, West Lafayette

A Methodology and Experience of Facilitating International Collaboration
Dr. Karim Altaai, James Madison University
Dr. Shannon N. Conley, James Madison University
Dr. Samy El-Tawab P.E., James Madison University

A Summer Immersive Program for Global Engineering Education with Focus on 3D Design and Structural Analyses
Prof. Soondo Kweon, Southern Illinois University, Edwardsville
Prof. Jun H. Park, Tongmyong University
Prof. Kookhyun Kim, Tongmyong University
Dr. Kee Joo Kim, Tongmyong University
Prof. Jeonghoon Song, Tongmyong University
Dr. Hooi-Siang Kang, Universiti Teknologi Malaysia
Prof. H. Felix Lee, Southern Illinois University, Edwardsville

A Core Leading Scheme in Deeply Cooperative Learning with a Mobile Focus
Dr. Takao Ichiko, ASEE

Deliverables from International Cooperation on an NIH-Funded Biomedical Engineering Project in Africa
Prof. David W. Gatchell Ph.D., Northwestern University
Prof. Akinniyi Aderediran Osuntoki Ph.D., University of Lagos
Prof. Akinwale Oladotun Coker P.E., University of Ibadan
Dr. Matthew R. Glucksberg, Northwestern University
Prof. Robert L. Murphy
Dr. Tania Douglas, University of Cape Town
Kara M. Palamountain

International Students’ Projects as a Part of Engineering Education
Prof. Anna Friesel, Technical University of Denmark

W133A - Underrepresented Populations
8:00 a.m. - 9:30 a.m., Room 255 A, Convention Center - Salt Palace
Sponsor: Pre-college Engineering Education Division
Moderators: Manuel Figueroa, Drexel University (Eng. & Eng. Tech.); Manuel Figueroa, The College of New Jersey

This session includes investigations into increasing participation in engineering from underrepresented groups.

Equity in Collaboration: My Ideas Matter, Too! K-12 Students’ Negotiation of Social Status in Collaborative Engineering Teams (Fundamental Research)
Mrs. Kayla R. Maxey, Purdue University, West Lafayette
Dr. Morgan M. Hynes, Purdue University, West Lafayette
From Tools to Tools: UAVs in Middle-school Engineering Education (RTP)
Miss Srinjita Bhaduri, University of Colorado, Boulder
Katie Van Home
Mr. John Daniel Ristvey Jr., UCAR Center for Science Education
Dr. Randy Russell, UCAR Center for Science Education
Prof. Tamara Sumner

Investigating the Fit Between Students’ Personal Interests and
**W133B - Middle School Students' Engineering Identity, Efficacy, Attitudes, and Perceptions**
8:00 a.m. - 9:30 a.m., Room 150 G, Convention Center - Salt Palace

**Sponsor:** Pre-college Engineering Education Division

**Moderator:** Margaret Pinnell, University of Dayton

Middle school students' engineering identity, efficacy, attitudes, and perceptions are discussed.

**Developing Engineering Proficiency and Self-efficacy Through a Middle School Engineering Course (Fundamental)**
- Dr. Jessica D. Gale, Georgia Institute of Technology
- Dr. Meltem Alemdar, Georgia Institute of Technology
- Dr. Jeremy Lingle, Georgia Institute of Technology
- Dr. Suni Haag Newton, Georgia Institute of Technology
- Dr. Roxanne A. Moore, Georgia Institute of Technology
- Mr. Jeffrey H. Rosen, Georgia Institute of Technology

**Engaging Children in Design Thinking Through Transmedia Narrative (RTP)**
- Dr. Glenn W. Ellis, Smith College
- Ms. Isabel Huff, Springfield Technical Community College
- Mr. Al Rudnitsky, Smith College
- Dr. Cheryl A. Bodnar, Rowan University
- Dr. Kaitlin Mallouk, Rowan University

**Student Perceptions of Engineering Based Upon Board Game Participation**
- Alexis Basantis, Rowan University
- Megan DiPietroantonio
- Amy B. Geary, Rowan University
- Melanie V. Ware, Rowan University
- Dr. Kahtlin Mallouk, Rowan University
- Dr. Cheryl A. Bodnar, Rowan University

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**W134 - Seeking Resilience and Learning to Thrive Through Engineering Education**
8:00 a.m. - 9:30 a.m., Room 260 B, Convention Center - Salt Palace

**Sponsor:** Liberal Education/Engineering & Society Division

**Moderator:** Jared Berezin, Massachusetts Institute of Technology

Thriveing for Engineering Students and Institutions: Definition, Potential Impact, and Proposed Conceptual Framework
- Ms. Julianna Sun Ge, Purdue University, West Lafayette
- Dr. Edward J. Berger, Purdue University, West Lafayette

**Inner Engineering: A Convergent Mixed Methods Study Evaluating the Use of Contemplative Practices to Promote Resilience Among Freshman Engineering Students**
- Mr. Mark V. Huerta, Arizona State University
- Dr. Kaitlyn Mallouk, Purdue University, West Lafayette

**Work in Progress: Understanding Student Perceptions of Stress as Part of Engineering Culture**
- Dr. Karin Jensen, University of Illinois, Urbana-Champaign
- Dr. Kelly J. Cross, University of Illinois, Urbana-Champaign

**Fostering Engineering Thinking in a Democratic Learning Space: A Classroom Application Pilot Study in the Azraq Refugee Camp, Jordan**
- Mr. Claudio Cesar Silva de Freitas, Purdue University, West Lafayette
- Zachary James Beyer, Purdue University, West Lafayette

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**W135A - Green and Sustainable Manufacturing Practices**
8:00 a.m. - 9:30 a.m., Room 252, Convention Center - Salt Palace

**Sponsor:** Manufacturing Division

**Moderator:** Vukica Jovanovic, Old Dominion University

**Green and Sustainable Manufacturing Practices**
- A Look into Badging Strategies in Engineering Education and Its Application to Energy and Manufacturing Certification Programs
  - Dr. Arif Sirinterlikci, Robert Morris University
  - Dr. Maria V. Kalevitch, Robert Morris University
- 4D Printing of Pressure Sensors and Energy Harvesting Devices for Engineering Education
  - Prof. Tzu-Liang Bill Tseng, University of Texas, El Paso
  - Dr. Aditya Akundi, University of Texas, El Paso
  - Dr. Hoejin Kim, University of Texas, El Paso
- PCM Heat Exchanger for Manufacturing Environment: Independent Study Case for Integrative Project-based Learning
  - Dr. Irina Nicoleta Ciobanescu Husanu, Drexel University
- Undergraduate Freshman Developing Advanced Research Project: Learn-by-Discovery Module to Investigate Energy Efficiency and Energy Conservation Principles
  - Dr. Irina Nicoleta Ciobanescu Husanu, Drexel University
  - Mr. Carlos Michael Ruiz, Drexel University
  - Benjamin G Cohen, Drexel University
  - Ms. Sarah Renee Andrieux

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**W135B - Automation in Manufacturing**
8:00 a.m. - 9:30 a.m., Room 151 D, Convention Center - Salt Palace

**Sponsor:** Manufacturing Division

**Moderators:** Hugh Jack, Western Carolina University; Arif Sirinterlikci, Robert Morris University

**Automation in Manufacturing**
- Engaging Students' Creativity through Designing a Low-cost Educational Robotic Arm
  - Ms. Shunafrica C. White, Elizabeth City State University

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Wednesday, June 27

W138 - Mechanical Engineering Division
Technical Session 8
8:00 a.m. - 9:30 a.m., Room 252, Convention Center - Salt Palace
Sponsor: Mechanical Engineering Division
Moderator: Amir Karimi, University of Texas, San Antonio

Alternatives to Textbook Homework Assignments
- Dr. Amir Karimi PE, University of Texas, San Antonio
- Dr. Randall D. Manteufel PE, University of Texas, San Antonio

A Study of Voluntary Problem Sets on Student Interest, Motivation, and Performance
- Dr. Philip Jackson, University of Florida

Generating Automated Problem Sets for Rapid Content Delivery and Adaptive Learning Modules
- Dr. Philip Jackson, University of Florida

Creating Problem Taxonomies for WeBWorK in Mechanical Engineering
- Dr. Agnes Germaine d'Entremont P.Eng., University of British Columbia, Vancouver
- Dr. Juan Abelló P.Eng., University of British Columbia, Vancouver

Standards-based Specifications Grading in a Hybrid Course
- Dr. Julie Mendez, Indiana University-Purdue University, Columbus

W139 - Applications of Technology in Mechanics Education
8:00 a.m. - 9:30 a.m., Room 255 D, Convention Center - Salt Palace
Sponsor: Mechanics Division

Moderator: Wael Abdulmajeed, University of Baghdad
The technologies we use in the classroom are diverse. Papers exploring the use of technology in the classroom and how to do so effectively.

If We Can’t Model a Cantilevered Beam, What Can We Model?
Helping Students Understand Errors in Vibration Experiments and Analyses
- Dr. Phillip Cornwell, Rose-Hulman Institute of Technology
- Dr. Simon Jones, Rose-Hulman Institute of Technology
- Dr. Daniel Takashi Kawano, Rose-Hulman Institute of Technology

Analysis of Basic Video Metrics in a Flipped Statics Course
Benjamin Keith Morris, The University of Georgia
Dr. Siddharth Savadatti, University of Georgia

Helping Students Learn Engineering Mechanics Concepts Through Integration of Simulation Software in Undergraduate Courses
- Lt. Col. Richard J. Gash PE, U.S. Military Academy
- Dr. Aaron Freidenberg, U.S. Military Academy
- Dr. Christopher H. Conley, U.S. Military Academy
- Mr. Paul M. Moody PE, U.S. Military Academy

Teaching Modal Analysis with Mobile Devices
Dr. Charles Riley PE, Oregon Institute of Technology
Using FEA as a Pedagogical Tool for Teaching Machine Component Design

Dr. Wendy S. Reffoor, Grand Valley State University
**Conference Sessions**

**Wednesday, June 27**

**W142 - New Engineering Educators Division Business Meeting**
8:00 a.m. - 9:30 a.m., Room 251 A, Convention Center - Salt Palace
Sponsor: New Engineering Educators Division

Free ticketed event.

**W148 - Systems Engineering Division Annual Business Meeting**
8:00 a.m. - 9:30 a.m., Room 250 A, Convention Center - Salt Palace
Sponsor: Systems Engineering Division
This is the annual business meeting of the Systems Engineering Division traditionally held during the ASEE Annual Conference and Expo. Current and prospective members are invited to attend. Free ticketed event.

**W151 - Women in Engineering Division Technical Session 4**
8:00 a.m. - 9:30 a.m., Room 254 C, Convention Center - Salt Palace
Sponsor: Women in Engineering Division
Moderator: Inci Ruzybayev, York College of Pennsylvania

- **Building and Breaching Boundaries: an Intersectional Coherent Group Approach to Advancing Women Faculty in Engineering**
  - Dr. Coleen Carrigan, California Polytechnic State University, San Luis Obispo
  - Saejin Kwak Tanguay, University of Washington
  - Dr. Joyce Yen, University of Washington
  - Dr. Julie Simmons Ivy, North Carolina State University
  - Dr. Cara Margherio, University of Washington
  - Prof. Eve A. Riskin, University of Washington
  - Dr. Christine S. Grant, North Carolina State University
  - Dr. M. Claire Horner-Devine, University of Washington and Counterspace Consulting

- **Salary Negotiations and Gender in Engineering Education**
  - Grace Panther, Oregon State University
  - Dr. Kacey Beddoes, University of Massachusetts, Lowell
  - Dr. Cheryl Llewellyn, University of Massachusetts Lowell

- **Women in STEM: What Experiences Influence Decisions**
  - Dr. Stephany Coffman-Wolph, University of Texas, Austin
  - Dr. Kimberly Gray, West Virginia University Inst. of Tech.

- **Women’s Motivation to Pursue Engineering Education and Careers: a Case Study of Malaysia**
  - Ms. S. Zahra Atiq, Purdue University, West Lafayette
  - Sarah Morton
  - Dr. Nehal I. Abu-lail, Washington State University

**W152 - Engagement in Practice: Engaging the Community Through Educational Outreach**
8:00 a.m. - 9:30 a.m., Room 257 B, Convention Center - Salt Palace
Sponsor: Community Engagement Division
Moderator: Henriette Burns, Washington State University, Vancouver

“Engagement in Practice” sessions include short presentations of each paper (3-5 minutes) with ample time remaining for facilitated discussion and sharing by presenters and members of the audience. Papers in this session are focused on providing descriptive detail of specific community engagement endeavors.

- **Engagement in Practice: Developing a Sustainable K-12 Outreach STEM Program**
  - Dr. Joan B. Schuman, Missouri University of Science & Technology
  - Dr. Katie Shannon, Missouri S&T

- **Engagement in Practice: Integration of an Engineering Service Learning Course with a High School Robotics Team**
  - Dr. Ryan A Munden, Fairfield University

- **Engagement in Practice: Infusing the STEM Pipeline Through Community Engaged Learning**
  - Sara Jordan-Bloch, Stanford University
  - Ms. Shoshanah Cohen, Stanford University

- **Engagement in Practice: Lessons Learned Partnering with Science Educators and Local Engineers in Rural Schools**
  - Ms. Holly Larson Lesko, Virginia Tech
  - Dr. Jacob R. Grohs, Virginia Tech
  - Dr. Holly M. Matusov, Virginia Tech
  - Dr. Gary R. Kirk, Virginia Tech
  - Dr. Cheryl Carrico P.E., Virginia Tech
  - Dr. Veronica van Montfrans
  - Mr. Andrew L. Gillen, Virginia Tech
  - Mrs. Tawni Paradise, Virginia Tech
  - Sarah Anne Williams, Virginia Tech
  - Dr. Liesl Baum, Virginia Tech

- **Engagement in Practice: STEM Engagement Through Mentoring**
  - Prof. Mariam Manuel, University of Houston
  - Mr. Ricky P. Greer, University of Houston
  - Dr. Jerrod A. Henderson, University of Houston
  - Dr. Virginia Snodgrass Rangel Rangel, University of Houston

- **Engagement in Practice: Tensions and Progressions of a Robotics Service-learning Program**
  - Mr. Matthew Aruch, University of Maryland College Park
  - Dr. David Tomblin, University of Maryland, College Park

Schedule subject to change: Please go to [www.asee.org/icp](http://www.asee.org/icp) for up to date information.
W155 - Assessment of Engineering Leadership Development
8:00 a.m. - 9:30 a.m., Room 259, Convention Center - Salt Palace
Sponsor: Engineering Leadership Development Division
Moderator: Steven Klosterman, Northeastern University

Dr. Ella Lee Ingram, Rose-Hulman Institute of Technology
Speakers: Todd M. Fernandez, Purdue University, West Lafayette; Dr. Nicholas Anthony Clegorne, Virginia Tech; Dr. Denise Rutledge Simmons, Virginia Tech; Dr. Cassandra J. Groen, Virginia Tech; Dr. Thomas Ward Lester, University of Kentucky; Mr. Joseph Anthony Colella, University of Kentucky College of Engineering
Faculty Ways of Knowing, Valuing, and Assessing Leadership in the Undergraduate Engineering Curriculum
Dr. Cassandra J. Groen, Virginia Tech
Dr. Denise Rutledge Simmons P.E., Virginia Tech
Dr. Nicholas Anthony Clegorne, Virginia Tech
Mr. Joseph Anthony Colella, University of Kentucky

But How Do You Feel?
Mr. Werner Zorman, Harvey Mudd College

Evolution of Leadership Behaviors During Two-semester Capstone Design Course in Mechanical Engineering
Rebecca Komarck, University of Colorado, Boulder
Dr. Daniel Knight, University of Colorado, Boulder
Dr. Angela R. Bielefeldt, University of Colorado, Boulder

Engineering Leadership Development Program - a Tenth-year Review and Assessment
Dr. Lawrence H. Holloway, University of Kentucky
Dr. Thomas Ward Lester, University of Kentucky
Mr. Joseph Anthony Colella, University of Kentucky College of Engineering

W180 - Competency-based Assessment in Faculty Development: Theory, Examples, and Demonstration
8:00 a.m. - 9:30 a.m., Room 151 E, Convention Center - Salt Palace
Sponsor: Faculty Development Constituency Committee
Speakers: Todd M. Fernandez, Purdue University, West Lafayette; Dr. Ella Lee Ingram, Rose-Hulman Institute of Technology

Learning Goals
There are four learning goals associated with this special session. In keeping with a purpose of demonstrating differing assessment methods, we will collect evidence that the learning goals have been satisfied during the session. As a result of attendance at this special session, participants will...
1. Identify basics, benefits, and challenges associated with competency-based assessment of faculty development programming.
2. Use a competency-based assessment process to create a list of potential competencies for one of their areas of faculty development.
3. Identify both the types of evidence that faculty could submit as competency evidence and the validity benchmarks that can be used in competency development.
4. Define and develop one complete competency from their list.

Description
One of the major challenges in faculty development is executing effective assessment and evaluation activities (Pellegrino, Chudowsky, and Glaser, 2001; National Research Council, 2000). Effective assessment is central to all forms of teaching and learning no matter the content or the audience. However, the nuances of faculty development often create impediments to effective assessment using traditional practices seen in everyday classrooms. These impediments include "one shot" instructional sessions, curricula focused on changes in faculty practice, difficulty in supporting distributed practice, and a distinctly different relationship between educators and learners (Fink, 2013). Together, these constraints make the application of traditional assessment approaches difficult and problematic, especially when relying on self-reports of learning. To address these challenges, we propose that faculty development professionals consider competency-based education and assessment models (as demonstrated in other professional fields, see Frank et al., 2010). This session provides the starting point for faculty developers and academic leaders to create their own competency-based assessment scheme.

In this session, we propose, explain, and demonstrate how competency-based education and assessment approaches provide advantages over traditional assessment practices for faculty development work. In the first portion of the session, we define competency-based education and assessment in comparison to traditional assessment practices. We then explore one example of competency-based assessment from a well-established faculty development program. Through the example, we illustrate the potential to use competencies as tools for formative and summative evaluation of faculty learning, evaluation, and assessment of instruction, and increasing faculty's reflective practice. After the example, we use the remainder of the time as a guided exercise in which faculty developers and academic leaders create their own competency-based assessment scheme. Through guided exercises, reflection, and collaboration, participants acquire both a theoretical understanding and practical evidence with which to understand how competency-based assessment works in practice.

Session Plan
The session will be divided into approximately 20-minute sections as follows:
1. Session introductions and introduction to the theory and practice of the competency-based assessment model.
2. Participants will identify a competency-based opportunity in their faculty development program and the session facilitators will present an example of competency development from our own work.
3. Participants will work on potential competencies for their opportunity and we will discuss evidence and validity in competency-based assessment.
4. Participants will develop and present a single competency that will be useful to their own faculty development work.
5. (10 minutes): Wrap-up discussion.

Products
In addition to satisfying the session learning goals, participants also produce several physical takeaways that allow them to use their new knowledge at their home institution. Those products include:
• A workbook containing all of the exercises, materials, and references used during the session.
• Access to an online repository documenting all participant work during the session and tying it to the learning goals of the special session.
• Their own work, which will include multiple competencies that they could develop as well as one fully developed competency.

Conference Sessions

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Schedule subject to change: Please go to www.asee.org/icp for up to date information
Conference Sessions

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Justification for Special Session
We believe that this topic and the learning goals merit the time and focus inherent in a special session for two reasons. First, the special session format combines what would otherwise function as three presentations (i.e., the theory, the example, and the tools) into one cohesive whole. Effectively covering this level of content using an active learning approach requires more time than is available in a typical paper presentation approach. Second, the special session format allows for an introduction, example, and then initial work that participants can take away and complete for themselves, working in their own roles and contexts. In that way, the session models the very elements of competency-based education and assessment that we are trying to teach. This meta-approach is intentional. Our goal is to show how the constraints of faculty development programming often make it necessary to take a longer-term view of both faculty development and assessment. In the special session, we do not create a full learning cycle, but give participants the tools needed to get experience in this area. The session is not a lecture or information-transmission experience; it is a session to prepare participants to go practice and develop competence. Third, the session will employ collaborative approaches throughout. These approaches involve building on participant’s perspectives, extend expertise, and personal examples of the content. Such approaches rely on a fundamentally different convention of experience than a traditional paper session.

References

W196D - Accreditation Activities Committee
8:00 a.m. - 9:30 a.m., Room 251 D, Convention Center - Salt Palace
Sponsor: ASEE Headquarters
Accreditation activities committee.

W211 - Distinguished Lecture: Bringing Engineering Out of the Classroom to Serve the Disability Community
9:45 a.m. - 11:15 a.m., Room 155 B, Convention Center - Salt Palace
Sponsors: Cooperative and Experiential Education Division; Pre-college Engineering Education Division; Biomedical Engineering Division; Women in Engineering Division; Minorities in Engineering Division; Multidisciplinary Engineering Division; Design in Engineering Education Division
Speaker: Albert Manero, University of Central Florida
Access to traditional prosthetics for children is challenging due to high costs, healthcare policies, and technology limits. A local family contacted Albert Manero while he was working on his graduate research. Their six-year-old, Alex Pring, was born without most of his right arm. Alex performed daily activities by making use of his left hand and his mom’s assistance. His family wanted to buy a prosthetic, but the high costs and accessibility challenges made that not feasible. Alex’s mom connected with Manero, then a doctoral engineering student at the University of Central Florida (UCF). Working with a passionate team of engineers and designers, they created a 3D-printed electromyographic arm for Alex, and Limbitless Solutions was born. Limbitless Solutions is a non-profit direct-support organization at UCF designing affordable bionic arms for children at no cost to families. Dr. Manero and his team advise research and design teams at UCF to improve access to bionics and to conduct research to advance empowerment technology. Engaging with K-12 local schools to promote the social impact that engineering is capable of, the team is looking to develop a more inclusive and creative engineering landscape for the future. Limbitless Solutions has received extensive national recognition for their work, including being featured as part of Microsoft’s Collective Project.

W2112 - Distinguished Lecture: A Voice for Change – Building an Inclusive Future with Local Policy and Engineers
9:45 a.m. - 11:15 a.m., Room 155 E, Convention Center - Salt Palace
Sponsors: ASEE Diversity Committee; Environmental Engineering Division; Civil Engineering Division; Community Engagement Division; Energy Conversion and Conservation Division; Liberal Education/Engineering & Society Division; Engineering Ethics Division
Speaker: Jackie Biskupski, Mayor, Salt Lake City
Since the Year of Action on Diversity, the social and political landscape of the United States has changed significantly. Finding ways to bridge divides is more important now than ever. In 2015, the very conservative Salt Lake City elected its second female, and first openly gay, mayor. Mayor Jackie Biskupski brought a vision for the future that built on the best of the city's culture as a community that values the environment, mutual support, and high quality of life. She also brought her understanding of how important vibrant small and large business activity is for a thriving community. Seeing environmental, economic, and social justice benefits for her city, she has made improving air quality and combating climate change keystones of her administration. She is leading her city to run on 100 percent clean energy by 2032 and to reduce carbon emissions by 80 percent by 2040. She has increased the number of shelters for the homeless in Salt Lake City and pushed for more transparency in policies related to police body cameras, improving life quality for all citizens. Biskupski will share her vision for how social justice and economic development can work together to build an inclusive future and the vital role of engineers in that future.

W220 - Distinguished Lecture: It Takes More Than Good Intentions – Do Engineers Have Responsibility for Social In/Justice?
9:45 a.m. - 11:15 a.m., Room 155 D, Convention Center - Salt Palace
Sponsors: Engineering Ethics Division; Liberal Education/Engineering & Society Division

Schedule subject to change: Please go to www.asee.org/icp for up to date information
In this session, Deborah Besser, director of the Center for Engineering Education at the University of St. Thomas, will introduce a model of cultural competency in mentoring – Strategies for Connecting Across Difference. This model emphasizes the importance of understanding, trust, and results in mentoring. Deborah G. Johnson, one of the leading experts in engineering ethics, has recently suggested that the social responsibilities of engineers should be understood not as the product of a social contract between the profession and society, but rather as a form of accountability in which engineers and the organizations of which they are a part assume obligations to explain and justify behavior and share norms regarding what needs to be explained, what counts as an adequate explanation, and what consequences might follow. As Johnson aptly points out, “Engineers are not required to explain or justify their behavior to publics until something goes wrong or until engineers—in the act of whistleblowing—bring something to the attention of a public.” Johnson urges us to pay attention to the ways in which the “social responsibilities of engineers are constructed and manifested through concrete practice in which norms and expectations are manifested and enforced.” The integration of engineering ethics with the perspectives of Science, Technology, and Society (STS) provides a framework for understanding the interaction between norms, expectations, and practices. In this lecture, Johnson will provide a roadmap for such integration.

W233 - Distinguished Lecture: Cultural Competency in Mentoring – Strategies for Connecting Across Difference
9:45 a.m. - 11:15 a.m., Room 155 A, Convention Center - Salt Palace
Sponsors: Pre-college Engineering Education Division; New Engineering Educators Division; Student Division; International Division; Women in Engineering Division; First-year Programs Division; Minorities in Engineering Division

Speaker: Lisa Fain, Center for Mentoring Excellence
There is near universal consensus that paying attention to diversity and inclusion is beneficial for student, staff, and faculty engagement and organizational success. Often, organizations employ mentoring programs to effect inclusion, or to help promote diversity within the organization. Rarely, however, do participants in these mentoring initiatives understand how much difference in culture, background and perspective can impact the mentoring relationship or how to leverage those differences to maximize the effectiveness of mentoring. In this session, Deborah Besser, director of the Center for Engineering Education at the University of St. Thomas, will introduce a model of cultural competency, create deeper understanding of the pillars of culture, and offer concrete strategies on how to leverage differences to create understanding, trust, and results in mentoring.
School of Mines and Technology, serving as head of the Department of Electrical Engineering from 1975 to 1983. He served as the founding dean of engineering at SUNY Binghamton from 1983 to 2001.

Dr. Feisel has held many positions in ASEE, including President in 1997-98 and Interim Executive Director in 2010-11. Currently chair of the Prism Editorial Advisory Board, he is a Fellow of ASEE and the National Society of Professional Engineers and a Life Fellow of IEEE. He is an active volunteer in ASEE, IEEE and his community on Maryland’s Eastern Shore.

Dr. Feisel is the author of Lyle’s Laws, for 10 years a regular column in The Bent of Tau Beta Pi and now collected as Lyle’s Laws published by Brooklyn River Press.

Stephanie Adams, Dean of Engineering, Old Dominion University, will discuss the impact of ASEE on the direction of the engineering curriculum, particularly through the various reports that have been developed by the Society. Her presentation will include an outline of the history of those reports and the effect they have had on what is taught in an engineering program. ASEE’s participation in the activities of ABET will also be discussed, along with some predictions of changes in the future.

Donna Riley, Head, School of Engineering Education, Purdue University, will consider the history of diversity in engineering education, recalling a time when women and minorities were a rarity in engineering and the faculties of engineering schools. Her presentation will trace ASEE’s efforts to alleviate some of this disparity and present some information on how the makeup of the engineering workforce has changed over the years. She will also offer her thoughts and insight on what ASEE and the profession can do in this area in the future.

Karl Smith, Professor Emeritus, University of Minnesota, will note that engineering faculty have not always been interested in the theory of teaching and learning—indeed, many are still not—but that the situation has changed somewhat over the years. His presentation will revisit the days when Educational Research and Methods was only beginning to have an impact and map the progress of the art and science of teaching in engineering and the contributions made to that progress by ASEE. He will also look into the future with suggestions of what we might expect in the years ahead.

W304 - Connecting BME Education to the "Real World"

11:30 a.m. - 1:00 p.m., Room 155 B, Convention Center - Salt Palace

Sponsor: Biomedical Engineering Division

Moderator: Kathleen Bieryla, University of Portland

These papers describe initiatives which help to connect BME students to the "real world."

How Do Biomedical Engineering Graduates Differ from Other Engineers? Bridging the Gap Between BME and Industry: A Case Study

Dr. Tanya M. Nocera, Ohio State University
Dr. Alexis Ortiz-Rosario, Ohio State University
Amena Shermadou, Ohio State University
Dr. David A. Delaine, Ohio State University

The Influence of an Externship on BME Predoctoral Students’ Career Development

Ms. Julia N. Savoy, University of Wisconsin-Madison
Prof. Mia K. Markey, University of Texas at Austin
Prof. Henry Grady Rylander III P.E., University of Texas at Austin

Year Two of the BEST Program: High School Science Teachers in Bioengineering

Dr. Anthony E. Felder, University of Illinois, Chicago
Dr. Miuri Kotche, University of Illinois, Chicago
Dr. Jennifer D. Olson, University of Illinois at Chicago
Janet Aderemi Omoteyin, University of Illinois at Chicago

Sustainable Development Challenge For BME

Prof. Joe Tranquillo, Bucknell University

W305 - ChemE Curriculum: Junior, Senior, and Graduate

11:30 a.m. - 1:00 p.m., Room 151 F, Convention Center - Salt Palace

Sponsor: Chemical Engineering Division

Moderator: Heather Chenette, Rose-Hulman Institute of Technology

This session highlights work related to junior, senior, and graduate-level chemical engineering topics, focusing on laboratories and professional responsibility.

Computer Simulations vs. Physical Experiments: A Gender Comparison of Implementation Methods for Inquiry-based Heat Transfer Activities

Dr. Katharyn E. K. Nottis, Bucknell University
Dr. Margot A. Vigeant, Bucknell University
Dr. Michael J. Prince, Bucknell University
Dr. Amy Frances Golightly, Bucknell University
Ms. Carrine Megan Gador, Bucknell University

Effective Teamwork Dynamics in a Unit Operations Laboratory Course

Dr. Erick S. Vasquez, University of Dayton
Dr. Zachary J. West, University of Dayton
Dr. Matthew DeWitt, University of Dayton
Dr. Robert J. Wilkens, University of Dayton
Dr. Michael J. Elsass, University of Dayton

Ethics and Societal Impacts in the Education of Chemical Engineering Undergraduate and Graduate Students

Dr. Angela R. Bielefeldt, University of Colorado, Boulder
Ms. Madeline Polmear, University of Colorado, Boulder
Dr. Chris Swan, Tufts University
Dr. Daniel Knight, University of Colorado, Boulder
Dr. Nathan E. Canney, University of Dayton

How We Teach: Unit Operations Laboratory

Dr. Margot A. Vigeant, Bucknell University
Dr. David L. Silverstein PE., University of Kentucky
Dr. Kevin D. Dahm, Rowan University
Dr. Laura P. Ford, University of Tulsa
Dr. Jennifer Cole, Northwestern University
Dr. Lucas James Landherr, Northeastern University

Dr. Kevin Ray Hadley, South Dakota School of Mines and Technology
Conference Sessions

Wednesday, June 27

W3112A - Creating Equity Through Structure and Pedagogy
11:30 a.m. - 1:00 p.m., Room 151 A, Convention Center - Salt Palace
Sponsor: ASEE Diversity Committee
Moderator: Andrea Haverkamp, Oregon State University
The papers in this session describe structural and pedagogical applications that improve equity in opportunities and outcomes for engineering students.

A Transition Community for Deaf and Hard of Hearing Students in Engineering Programs
Dr. Raja S. Kushalnagar, Gallaudet University
Gary Walter Behm

Adding Diversity and Culture to the Engineer’s Toolkit: Evaluating a Unique Option for Engineering Students
Ms. Chelsea Nneka Onyeador, Stanford University
Dr. Shannon Katherine Gilmartin, Stanford University
Dr. Sheri Sheppard, Stanford University
Dr. Gloria Trujillo, Stanford University
Dr. Carol B. Muller, Stanford University

Building STEM Pathways for Students with Special Abilities
Dr. Peter Golding, University of Texas, El Paso
Celena Arreola, American Society for Engineering Education

Solving Problems of Mathematics Accessibility with Process-driven Math: Methods and Implications
Dr. Canek Moises Luna Phillips, Rice University
Ms. Ann Patrice Guile, Auburn University at Montgomery

W313 - Design in Engineering Education Division Technical Session 11
11:30 a.m. - 1:00 p.m., Room 253 A, Convention Center - Salt Palace
Sponsor: Design in Engineering Education Division

Developing an Observation Protocol to Categorize Formative Assessment in Engineering Courses
Mr. Max William Blackburn, University of Michigan
Dr. Aaron W. Johnson, University of Michigan
Dr. Cynthia J. Finelli, University of Michigan

Lean LaunchPad and Customer Discovery as a Form of Qualitative Research
Dr. Cory Hixson, Rowan University
Dr. Ella Lee Ingram, Rose-Hulman Institute of Technology
Dr. Rachel McCord, University of Tennessee, Knoxville
Dr. Julia M. Williams, Rose-Hulman Institute of Technology

Data Visualization for Time-resolved, Real-time Engineering Writing Processes
Dr. Catherine G.P. Berdanier, Pennsylvania State University, University Park
Prof. Natasha Treliger Buswell, University of California, Irvine
Ms. Zixuan (Victoria) Zhao, Purdue University

Using a Critical Incident-centered Transition Theory Framework to Explore Engineering Education Research Faculty Transitions
Dr. Alexandra Coso Strong, Franklin W. Olin College of Engineering
Dr. Courtney S. Smith-Orr, University of North Carolina, Charlotte
Dr. Cheryl A. Bodnar, Rowan University
Dr. Walter C. Lee, Virginia Tech
Dr. Courtney June Faber, University of Tennessee, Knoxville
Dr. Erin J. McCave, University of Houston

Establishing Quality in Qualitative Research with Linguistically and Culturally Diverse Research Participants
Dr. Amy Wilson-Lopez, Utah State University - Engineering Education
Karen Hazel Washburn Washburn, Utah State University
Indhira María Hasbún, Virginia Tech

Work in Progress: A Markov Chain Method for Modeling Student Behaviors
Dr. Corey T. Schimpf, The Concord Consortium
Ms. Molly H. Goldstein, Purdue University, West Lafayette
Dr. Robin Adams, Purdue University, West Lafayette
Dr. Jie Chao, The Concord Consortium
Dr. Senay Purzer, Purdue University, West Lafayette
Dr. Charles Xie, The Concord Consortium

W314 - Research Methods
11:30 a.m. - 1:00 p.m., Room 150 E, Convention Center - Salt Palace
Sponsor: Educational Research and Methods Division
Moderators: Emily Dringenberg, Ohio State University; Beth Myers, University of Colorado, Boulder

Educational Research and Methods Division Technical Session

W315 - Different Strategies for Preparing Students to Tackle the RF Engineering Challenges of Tomorrow: A Panel Discussion
11:30 a.m. - 1:00 p.m., Room 150 F, Convention Center - Salt Palace
Sponsor: Electrical and Computer Division
Moderator: Erica Messinger, Keysight Technologies
Speakers: Dr. Julio Urbina, Pennsylvania State University,
Work in Progress: Research-based Teaching in Undergraduate Thermofluid Mechanical Engineering Courses in a Primary Undergraduate University
Dr. Farshid Zabihian, California State University, Sacramento

Development and Implementation of a Power and Energy Engineering Minor with Limited Resources: First Results and Lessons Learned
Dr. Radian G. Belu, Southern University and A&M College
Prof. Lucian Ionel Cioca, Lucian Blaga University of Sibiu
Dr. Richard Chiou, Drexel University

Regenerative Braking System on a Conventional Bike
Dr. Bala Maheswaran, Northeastern University
Mr. Nicolas Berna Tedori
Mr. Eamon J. Whitmore, Northeastern University
Miss Bailey L. Ritchie
Mr. Logan Gross, Northeastern University

The trend is clear: Technology innovations will increase at even faster rates in the future. This has been particularly true in communications as RF technology becomes ubiquitous in daily life. The IoT explosion and 5G revolution are driving increased demand for RF engineers. This poses a challenge to schools for keeping up with that demand and best preparing the next generation of RF engineers.

This session will be a panel discussion bringing together voices from multiple universities to share how they are each innovating their RF curriculum and helping prepare engineering students to be ready to tackle tomorrow’s RF challenges. More specifically, we will learn about how the University of Arizona, the University of Notre Dame, Pennsylvania State University, the University of South Florida, and the Georgia Institute of Technology are taking advantage of partnerships with industry to accelerate their impact.

Each of these schools have their students demonstrate RF technical knowledge, design expertise, and hands-on measurement proficiency in the use of Keysight EEsof EDA software design tools and Keysight instruments. Students can complete qualification as Keysight Technologies, Inc. RF and Microwave Industry-ready students demonstrate immediate value to prospective employers while confirming each university’s commitment to preparing students for future industry contributions. The program utilizes an industry workflow environment providing a comprehensive way to simulate, measure, and analyze communications components and systems.

The panel, moderated by Keysight Technologies, will highlight what strategies each of these universities have adopted, leveraging Keysight’s RF and Microwave Industry-ready Student Certification Program to develop RF industry-ready engineers. These include partnering with other third-party companies, use of particular resources, etc. Attendees will be inspired with ideas of what they too might be able to leverage to help prepare the next generation of RF engineers to start contributing to the abundant RF technology opportunities.
Wednesday, June 27

Conference Sessions

11:30 a.m. - 1:00 p.m., Room 253 B, Convention Center - Salt Palace
Sponsor: Engineering Management Division
Moderator: Elizabeth Cudney, Missouri University of Science & Technology

Applying Systems Engineering Tools to Teach Systems Engineering in an Engineering Management Program
Dr. Sandra L. Furterer, University of Dayton

Impact of Process Tampering on Variation
Dr. Mustafa Shraim, Ohio University

A Systems Approach to Stakeholder Engagement in Accountability of Regional Universities
Dr. David Elizandro, Tennessee Technological University
Dr. Angelo A. Volpe, Tennessee Technological University
Dr. David H. Huddleston, Tennessee Technological University

Innovative Higher Education Teaching and Learning Techniques: Implementation Trends and Assessment Approaches
Piyush Taneja
Ms. Elnaz Safapour, University of Texas at Arlington
Dr. Sharareh Keranshachi, University of Texas at Arlington

W324 - Entrepreneurship & Engineering Innovation Division Technical Session 6
11:30 a.m. - 1:00 p.m., Room 257 B, Convention Center - Salt Palace
Sponsor: Entrepreneurship & Engineering Innovation Division
Moderators: David Novick, University of Texas, El Paso; Karl Schubert, University of Arkansas

Integrating Entrepreneurial-minded Learning in Electronic Design Course
Dr. Jing Guo, Colorado Technical University
Prof. John M. Santiago Jr., Colorado Technical University

Changing Minds, Transforming Learning Environments: A Collaborative Approach to Innovation and Entrepreneurship
Dr. Brian Bielenberg, Khalifa University of Science and Technology
Dr. Ali Bousabid, Khalifa University of Science and Technology
Dr. Sami Amin, Khalifa University of Science and Technology

Fusing Introduction to Engineering and Intercultural Communication and Its Effect on the Customer Awareness Aspect of the Entrepreneurial Mindset
Dr. Hao Lin Zhu, Arizona State University
Mr. Ian Derk, Arizona State University
Stephanie Sowl, Arizona State University
Dr. Natalie Nailer

Effect of Entrepreneurial Mindset on Funding Opportunities for Fundamental Research

W327 - First-year Programs Division: Closing Session
11:30 a.m. - 1:00 p.m., Room 155 D, Convention Center - Salt Palace
Sponsor: First-year Programs Division
Moderators: Kerry Meyers, University of Notre Dame; Rachel McCord, University of Tennessee, Knoxville; John Estell, Ohio Northern University

No papers will be presented during this session; rather it is a discussion of how ASEE 2018 has gone and discussions of ways to improve the conference.

W333 - Makerspaces
11:30 a.m. - 1:00 p.m., Room 151 G, Convention Center - Salt Palace
Sponsor: Pre-college Engineering Education Division
Moderator: Rebekah Hammack, National Science Foundation

Learn about makerspaces in pre-college engineering education.

Hk Maker Lab: Creating Engineering Design Courses for High School Students (Evaluation -or- Other)
Dr. Aaron Kyle, Columbia University
Ms. Christine Kovich, HYPOTHEkids
Mr. Michael A. Carapezza, Hk Maker Lab

K-2 Students’ Computational Thinking Engagement in Formal and Informal Learning Settings: A Case Study (Fundamental)
Ms. Hoda Ehsan, Purdue University, West Lafayette
Ms. Tikyna Monique Dandridge, Purdue University, West Lafayette
Dr. Ibrahim H. Yeter, Purdue University, West Lafayette
Dr. Monica E. Cardella, Purdue University, West Lafayette

Youth Attitudes Towards Assessment Tools in After-school Informal Learning and Employment Training Programs
Dr. Foad Hamidi, University of Maryland, Baltimore County
Mr. William Easley, University of Maryland, Baltimore County
Stephanie Grimes, Digital Harbor Foundation
Shawn Grimes, Digital Harbor Foundation
Dr. Amy Hurst, University of Maryland, Baltimore County

*But, What Do You Want Me to Teach?: Best Practices for Teaching in Educational Makerspaces (RTP)
Miss Avneet Hira, Purdue University, West Lafayette
Ms. Chanel Beebe, Purdue University, West Lafayette
Mrs. Kayla R. Maxey, Purdue University, West Lafayette
Dr. Morgan M. Hynes, Purdue University, West Lafayette

W334A - Meeting for Incoming/Current Program Chairs and Division Chairs
11:30 a.m. - 1:00 p.m., Room 251 F, Convention Center - Salt Palace
Sponsors: Liberal Education/Engineering & Society Division; Aerospace Division; Biomedical Engineering Division; Chemical Engineering Division; College Industry Partnerships Division;

Schedule subject to change: Please go to www.asee.org/icp for up to date information
Community Engagement Division; Computers in Education Division; Computing and Information Technology Division; Construction Engineering Division; Continuing Professional Development Division; Cooperative and Experiential Education Division; Educational Research and Methods Division; Engineering and Public Policy Division; Engineering Design Graphics Division; Engineering Libraries Division; Engineering Management Division; Engineering Technology Division; Entrepreneurship & Engineering Innovation Division; Environmental Engineering Division; Faculty Development Constituent Committee Division; Faculty Development Constituency Committee; First-year Programs Division; Graduate Studies Division; Industrial Engineering Division; Instrumentation Division; Mathematics Division; Mechanics Division; Military and Veterans Division; New Engineering Educators Division; Pre-college Engineering Education Division; Software Engineering Division; Student Division; Women in Engineering Division

Free ticketed event.

[This is a “ticketed event” so we can contact registrants; all program chairs and division chairs will be admitted at the door on a space-available basis. Please join us.]

The Incoming/Current Program Chairs & Division Chairs’ Meeting continues provide a valuable opportunity for division chairs and program chairs to discuss topics of common interest and to share “best practices” not only with their own incoming program chairs, but with program chairs across the divisions. Given the regular rotation of officers, we have upheld this as an annual event, both to enhance ASEE program practices and to foster communication across the divisions. (It is separate from, and is designed to complement, the ASEE HQ session introducing new program chairs to Monolith and the ASEE reviews process.) Our proposed agenda for this year’s meeting is as follows:

• What was the “neatest thing” that you saw at this year’s conference?
• Highlights from last year’s program/division chairs’ meeting.
• Organizing an ASEE report on the “Culture of Teaching.”
• . . . . . . . . Advice for incoming program chairs.
• . . . . . . . . Report from the Town Hall Meeting.
• . . . . . . . . Other topics as may arise.

We invite any and all current and incoming program and division chairs to attend this session.
ASEE Ad Hoc Committee on Intervisional Cooperation
Atsushi Akera (LEES), Chair
Alan Cheville (ERM)
John Estell (First Year)
Susannah Howe (DEED)
Mark Killgore (Civil)
Joe Tranquillo (Biomedical), Chair Elect

Free ticketed event.

W334B - Undergraduate Peer Educators: Mentoring, Observing, Learning
11:30 a.m. - 1:00 p.m., Room 151 C, Convention Center - Salt Palace
Sponsor: Liberal Education/Engineering & Society Division
Moderator: Amber Genau, University of Alabama at Birmingham

Successes and Challenges in Supporting Undergraduate Peer Educators to Notice and Respond to Equity Considerations Within Design Teams
Dr. Chandra Anne Turpen, University of Maryland, College Park
Dr. Ayush Gupta, University of Maryland, College Park
Dr. Jennifer Radoff, University of Maryland, College Park
Andrew Elby, University of Maryland, College Park
Hannah Sabo
Dr. Gina Marie Quan, University of Maryland, College Park

Motivational Factors of Undergraduate Engineering Students in Introductory Non-technical Courses
Dr. YunJeong Chang, University of Virginia
Dr. Rider W. Foley, University of Virginia

Peer Review and Reflection in Engineering Labs: Writing to Learn and Learning to Write
Dr. Vanessa Svhila, University of New Mexico
Ms. Catherine Anne Hubka, University of New Mexico
Prof. Eva Chi, University of New Mexico

Using Undergraduate Mentors to Scale the Teaching of Engineering Writing
Mr. Michael Alley, Pennsylvania State University, University Park

W334C - Embedding Sociotechnical Systems Thinking I
11:30 a.m. - 1:00 p.m., Room 155 A, Convention Center - Salt Palace
Sponsor: Liberal Education/Engineering & Society Division
Moderator: Rider Foley, University of Virginia

Measuring Change over Time in Sociotechnical Thinking: A Survey/validation Model for Sociotechnical Habits of Mind
Dr. Jon A. Leydens, Colorado School of Mines
Dr. Kathryn Johnson, Colorado School of Mines
Dr. Stephanie Claassen, Colorado School of Mines
Prof. Jenifer Blacklock, University of Colorado, Boulder
Dr. Barbara M. Moskal, Texas Tech University
Olivia Cordova, Colorado School of Mines

Engineering and Sustainability: The Challenge of Integrating Social and Ethical Issues into a Technical Course
Dr. Natasha A. Andrade, University of Maryland, College Park
Dr. David Tomblin, University of Maryland, College Park

Connecting with First-year Engineering Students’ Interest in Social Justice Issues through Ethics Lessons to Sustain Student Retention in Engineering
Ms. Kathryn Waugaman, University of Colorado Boulder
Dr. Janet Y. Tsai, University of Colorado, Boulder
Dr. Malinda S. Zarske, University of Colorado, Boulder

W339 - Teaching Methods for Engineering Mechanics Courses
11:30 a.m. - 1:00 p.m., Room 255 B, Convention Center - Salt Palace

Schedule subject to change: Please go to www.asee.org/icp for up to date information
Conference Sessions

W342 - Assessment of Student Learning – New Engineering Educators Division
11:30 a.m. - 1:00 p.m., Room 257 A, Convention Center - Salt Palace
Sponsor: New Engineering Educators Division
Moderator: Vimal Viswanathan, San Jose State University
Explore grading strategies and innovative assessment techniques.

W345 - Engineering Physics and Physics Division Technical Session I
11:30 a.m. - 1:00 p.m., Room 150 D, Convention Center - Salt Palace
Sponsor: Engineering Physics and Physics Division
Moderators: Bala Maheswaran, Northeastern University; Angeles Dominguez, Tecnologico de Monterrey, Monterrey, MEXICO and Universidad Andres Bello, Santiago, CHILE

W355 - Engineering Leadership Competency and Skill Development
11:30 a.m. - 1:00 p.m., Room 151 D, Convention Center - Salt Palace
Sponsor: Engineering Leadership Development Division
Moderator: Ebonee Williams, University of California, San Diego

Schedule subject to change: Please go to www.asee.org/icp for up to date information
**Conference Sessions**

**University Park**
Dr. Meg Handley, Pennsylvania State University, University Park
Mr. Andrew Michael Erdman, The Pennsylvania State University

**W380 - Faculty Development Lessons Learned Poster Session**
11:30 a.m. - 1:00 p.m., Room 151 E, Convention Center - Salt Palace
Sponsor: Faculty Development Constituency Committee
Moderator: Stephanie Cutler, Pennsylvania State University, University Park
To encourage sharing exciting practices in faculty development, lessons learned papers will be presented during this poster session. Come ask presenters about their program successes and the lessons we can learn from each other.

De-risking Transdisciplinary Research by Creating Shared Values
Dr. Donna C. Llewellyn, Boise State University
Dr. William L. Hughes, Boise State University

Engaging Faculty in Continuous Improvement: The Context of an ABET Accreditation Process
Dr. Angelica Burbano, Universidad Icesi
Dr. Gonzalo V. Ulloa, Universidad Icesi
Ing. Juliana Jaramillo, Universidad Icesi
Dr. Norha M. Villegas, Universidad Icesi
Ing. Lina M. Quintero, Universidad Icesi
Prof. Alvaro Pachon, Icesi University

Lessons Learned: Collaborative Faculty Development in Civil Engineering—Moving from an Individual Practice of Teaching to a Community of Scholars of Teaching and Learning
Dr. Elizabeth G. Jones, University of Nebraska, Lincoln

Lessons Learned: A Database-supported Workflow for Midterm Course Assessments
Dr. Ken Yasuhara, University of Washington
Dr. Jim L. Borgford-Parnell, University of Washington

Lessons Learned: Improving the New Faculty Orientation Program
Dr. Alice E. Grimes, Air Force Institute of Technology
Dr. Sharon Clayton Bommer, KBRWyle
Dr. Adediji B. Badiru P.E., Air Force Institute of Technology

**W390 - ASEE Annual Awards Ceremony and Lunch Sponsored by the Boeing Company and Dassault Systèmes**
11:30 a.m. - 1:00 p.m., Grand Ballroom I, Convention Center - Salt Palace
Sponsor: ASEE Board of Directors
The Annual ASEE Awards Ceremony and Lunch ASEE offers awards in a variety of areas, from best paper and teaching recognition, professional and technical honors, to a lifetime achievement award. This event showcases some of ASEE’s best and brightest, including our national award winners.
Award winners and their guests are complimentary. Others can attend for $50.

Ticketed event: ASEE Annual Awards Lunch - $50.00 advanced registration and $60.00 on-site registration

**W396 - International Forum: Networking Luncheon & Keynote Speaker**
11:30 a.m. - 1:00 p.m., Salon E, HQ Hotel - Marriott at City Creek
Sponsor: ASEE Headquarters
Please join us for a networking lunch with international colleagues accompanied by a keynote speech from Jose Carlos Quadrado, immediate past president of LACCEI and current vice president of the Instituto Superior de Engenharia do Porto.
Ticketed event: $75.00 advanced registration and $85.00 on-site registration.

**W396B - EER&I Networking Session: Connecting and Expanding Engineering Education Research & Innovation (EER&I)**
11:30 a.m. - 1:00 p.m., Room 250 C, Convention Center - Salt Palace
Sponsor: ASEE Headquarters
Speakers: Dr. Ruth A. Streveler, Purdue University, West Lafayette; Dr. Karl A Smith, University of Minnesota, Twin Cities; Dr. Rocio C Chavela Guerra, American Society for Engineering Education
This networking session will be facilitated by Dr. Rocio C. Chavela Guerra (American Society for Engineering Education), Dr. Karl A. Smith (University of Minnesota/Purdue University), and Dr. Ruth A. Streveler (Purdue University).
The principal aim of this session is to provide an opportunity for colleagues with established engineering education research & innovation programs to network with one another and provide guidance to colleagues who are considering establishing engineering education research centers and Ph.D. programs.
To include or update your program listing, please prepare a one-slide description of your engineering education research and/or graduate program to share. Programs will be displayed in a rolling slide show. Presentation materials will be posted to the Collaboratory for Engineering Education Research (CLEERhub). Please send your brief description (one slide please) to Karl Smith at ksmith@umn.edu.

**W435 - Manufacturing Division Business Meeting**
12:00 p.m. - 2:00 p.m., Room 250 B, Convention Center - Salt Palace
Sponsor: Manufacturing Division
Manufacturing Division Business Meeting

**W401 - Aerospace Division Technical Session 2**
1:30 p.m. - 3:00 p.m., Room 254 A, Convention Center - Salt Palace
Sponsor: Aerospace Division
Moderators: Antonette Cummings, University of Wisconsin, Platteville; Srikanth Gururajan, Saint Louis University, Parks College of Eng.

Aerospace Engineering Initiative at the University of Maine
Dr. Masoud Rais-Rohani P.E., University of Maine
Dr. David S. Rubenstein, University of Maine

Schedule subject to change: Please go to www.asee.org/icp for up to date information
Wednesday, June 27

Conference Sessions

Dr. Wilhelm A. Friess, University of Maine
Aerospace Capstone Design: Interactive Initial Sizing Estimates for Increasing Designer Intuition and Mitigating Risk in the Early Stages of Aircraft Conceptual Design
Dr. D. Blake Stringer, Kent State University
Mr. Dakota William Bunner
Robert William Winker
An Elective in Rocketry
Dr. Paul F. Penko P.E., Baldwin Wallace University
Inclusion of Sustainability Analysis in a National Airport Design Competition
Prof. Mary E. Johnson Ph.D., Purdue Polytechnic Institute
Mr. Yue Gu, Purdue University
Ms. Lorraine E. Holtaway, Purdue Polytechnic Institute
Mapping Design Processes to Practicing Engineers’ Perceptions of Uncertainty in Aerospace Design
Marty Mathews Jr., University of Wisconsin, Platteville
Dr. Antonette T. Cummings P.E., University of Wisconsin, Platteville

W405A - You Can Do It! Overcoming Common Challenges in Engineering Education Research
1:30 p.m. - 3:00 p.m., Room 151 F, Convention Center - Salt Palace
Sponsor: Chemical Engineering Division
Speakers: Dr. Matthew Cooper, North Carolina State University; Dr. Milo Koretsky, Oregon State University
Are you interested in performing rigorous engineering education research studies but intimidated by the many challenges posed by experimental design, IRB approval, quantitative and/or qualitative assessment, not to mention asking less-than-interested colleagues to collect data for your studies in their classes? Are you wondering how to best expand your ASEE conference work to a more rigorous journal publication? If so, this workshop is for you! Two members of the Chemical Engineering Division will share stories of successes, oversights, and lessons learned from their experiences completing research studies in hopes of passing tips on to fellow researchers.

W406 - Course Structuring for Effective Student Engagement
1:30 p.m. - 3:00 p.m., Room 251 C, Convention Center - Salt Palace
Sponsor: Civil Engineering Division
Moderators: David Saftner, University of Minnesota Duluth; Jennifer Retherford, University of Tennessee, Knoxville
Possibilities for Technology-enhanced Active Learning of Structural Steel Design
Dr. Ryan L. Solonsky P.E., Pennsylvania State University, University Park
Where Grammar, Content, and Professional Practice Meet: The Case of the Passive Voice
Dr. Susan Conrad, Portland State University
Kenneth Lamb, California State Polytechnic University, Pomona
Mr. Timothy James Pfeiffer P.E., Foundation Engineering, Inc.
The Use of GeoGebra Virtual Interactives in Statics to Increase Conceptual Understanding
Mr. Daniel W. Baker Ph.D., P.E., Colorado State University
Strategies for Flipping Geology for Engineers with Limited Time and Resources
Dr. Kristin M. Sample-Lord P.E., Villanova University
Dr. Andrea L. Welker, Villanova University
Prof. Patricia M. Gallagher P.E., Drexel University
The Influence of Grading Bias on Reinforced Concrete Exam Scores at Three Different Universities
Dr. Benjamin Z. Dymond, University of Minnesota, Duluth
Dr. Matthew Swenty P.E., Virginia Military Institute
Dr. Chris Carroll, Saint Louis University

W408 - COED: Online and Blended Learning Part 2
1:30 p.m. - 3:00 p.m., Room 355 B, Convention Center - Salt Palace
Sponsor: Computers in Education Division
Moderator: Alan Beckman, University of Illinois, Urbana-Champaign
This session will be the second of two sessions dealing with papers related to online and blended learning.
A Virtual Reality Course Using EON Reality: Students' Experiences
Dr. Nebojsa I. Jaksic, Colorado State University, Pueblo
The Internet Will Not Replace Us
Dr. Michelle E. Jarvie-Eggar, Michigan Technological University
Ms. Amber Kemppainen, Michigan Technological University
Mr. Thomas M. Freeman M.Ed., Michigan Technological University
Student and Instructor Perceptions of Online Engineering Education Videos
Dr. Luke S. Lee P.E., University of the Pacific
Dr. Hector Estrada, University of the Pacific
Dr. Mehdi Khazaeli, University of the Pacific
Evaluating the Effects of Highlighting Text Animations on the Attention Distribution of Students with Math Learning Difficulties
Ms. Shuang Wei, Purdue University, West Lafayette
Ms. Qingli Lei
Dr. Yingjie Chen, Purdue University, West Lafayette
Prof. Yan Ping Xin
Dr. Signe Kastberg, Purdue University, West Lafayette

W4112A - Action on Diversity - Round Table Conversations on Diversity, Equity, and Inclusion
1:30 p.m. - 3:00 p.m., Room 150 F, Convention Center - Salt Palace
Sponsors: ASEE Diversity Committee; International Division; Minorities in Engineering Division
Moderator: Susan Walden, University of Oklahoma
Speaker: Prof. Rebecca A. Bates, Minnesota State University, Mankato

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Conference Sessions

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Bring your voice to the table. We will have multiple topics for small groups to discuss, including how to start a difficult conversation about diversity. Come ready to listen, learn, and contribute. We will provide an opportunity to plan for next steps that all can take to support diversity, equity, and inclusion in engineering.

W414 - Curricular Transformation
1:30 p.m. - 3:00 p.m., Room 155 B, Convention Center - Salt Palace
Sponsor: Educational Research and Methods Division
Moderators: Nelson Pearson, University of Nevada, Reno; Farrah Fayyaz, Concordia University
Educational Research and Methods Division Technical Session
Faculty and Student Experiences of Curriculum Reform: A Case Study of the Chemical Engineering Program at the University of Cape Town
Mr. Hilton Heydentrech, University of Cape Town
Dr. Jennifer M. Case, Virginia Tech

Development and Evaluation of an Evidence-based Instrumentation Course in Civil Engineering
Prof. Shawn Griffiths, University of Wyoming
Dr. Janet Seeley

Examining the Replication – or Mutation – Processes of Implementing a National Model for Engineering Mathematics Education at a New Site
Dr. Janet Y. Tsai, University of Colorado, Boulder
Kevin O'Connor, University of Colorado, Boulder
Dr. Beth A. Myers, University of Colorado Boulder
Dr. Jacqueline F. Sullivan, University of Colorado, Boulder
Prof. Derek T. Reamon, University of Colorado, Boulder
Dr. Kenneth M. Anderson, University of Colorado, Boulder

How Engineering Educators Use Heuristics When Redesigning an Undergraduate Embedded Systems Course
Dr. Nicholas D. Fila, Iowa State University
Dr. Seda McKilligan, Iowa State University
Mr. Steven Joseph Abramsky, Iowa State University

W414B - Maker Communities and Authentic Problem Solving
1:30 p.m. - 3:00 p.m., Room 155 B, Convention Center - Salt Palace
Sponsor: Educational Research and Methods Division
Moderators: Lee Martin, University of California, Davis; Micah Lande, Arizona State University
Educational Research and Methods Division Technical Session

What Have We “Learned” from Maker Education Research? A Learning Sciences-base Review of ASEE Literature on the Maker Movement
Steven Weiner, Arizona State University, Polytechnic campus
Dr. Micah Lande, Arizona State University
Dr. Shawn S. Jordan, Arizona State University, Polytechnic campus

Impact of Prior Experiences on Future Participation in Active Learning
Mr. Robert Matthew DeMonbrun, University of Michigan

Dr. Cynthia J. Finelli, University of Michigan

Professional and Personal Use of Reflection by Engineering Faculty, Students, and Practitioners
Dr. Adam R. Carberry, Arizona State University
Dr. Trevor Scott Harding, California Polytechnic State University, San Luis Obispo
Dr. Patrick J. Cunningham, Rose-Hulman Institute of Technology
Dr. Kristine R. Csavina, Colorado School of Mines
Ms. Michelle Choi Ausman, California Polytechnic State University, San Luis Obispo
Diana Lau, California Polytechnic State University, San Luis Obispo

Engaging Undergraduate Students in Hands-on Research Using Undergraduate-specific Small Internal Grants from the University
Dr. Muhammad Pervez Jahan, Miami University
Ms. Shahnaz J. Aly, Western Kentucky University

Engineering Design Days: Engaging Students with Authentic Problem-solving in an Academic Hackathon
Mr. Christopher Rennick, University of Waterloo
Dr. Carol Hulls P.Eng., University of Waterloo
Dr. Derek Wright P.Eng., University of Waterloo
Dr. Andrew J. B. Milne, University of Waterloo, Mechanical and Mechatronics Engineering
Eugene Li, University of Waterloo
Prof. Sanjeev Bedi P.Eng., University of Waterloo

Exploring Making-based Pedagogy in Undergraduate Mezzanine-level Engineering Courses
Mr. Michael Scott Sheppard Jr., Arizona State University
Dr. Shawn S. Jordan, Arizona State University, Polytechnic campus
Dr. Micah Lande, Arizona State University
Dr. Ann F. McKenna, Arizona State University, Polytechnic campus

W415 - Electrical and Computer Division Technical Session 8
1:30 p.m. - 3:00 p.m., Room 257 B, Convention Center - Salt Palace
Sponsor: Electrical and Computer Division
Moderator: Kenneth Connor, Rensselaer Polytechnic Institute

Harnessing State-of-the-Art Internet of Things Labs to Motivate First-year Electrical and Computer Engineering Students
Dr. David John Orser, University of Minnesota
Mr. Kia Bazargan, University of Minnesota
John Sartori, University of Minnesota

Design and Implementation of a Health-monitoring Design Project in an Introductory Digital Design Course
Dr. Matthew A. Watkins, Lafayette College

Requirements for the Effective Application of Personal Instrumentation in ECE Undergraduate Courses
Prof. Kenneth A. Connor, Rensselaer Polytechnic Institute
Dr. Dianna Newman, University at Albany-SUNY
Kathy Ann Gullie Ph.D., Gullie Consultant Services
W423A - Electrical/Electronic ET Issues
1:30 p.m. - 3:00 p.m., Room 151 C, Convention Center - Salt Palace
Sponsor: Engineering Technology Division
Moderators: Melany Ciampi, Safety, Health and Environment Research Organization; Kathy Katni-Lokhurst,

An Arduino-based Programmable Logic Control (PLC) Lab Activity for Undergraduate Engineering and Technology (ETM) Students
Dr. Curtis Cohenour P.E., Ohio University
Design and Implementation of a New Instrumentation and Interface Undergraduate Course Using LabVIEWTM myDAQ
Dr. Reg Recayi Pecen, Sam Houston State University
Dr. Faruk Yildiz, Sam Houston State University
Matt Albrecht
Dr. Iftekhhar Ibne Basith, Sam Houston State University
Collaborated Efforts in TI ARM M4/32Bits Microcontroller
Curricula Developments and Assessments
Dr. Steve C. Hsiung, Old Dominion University
Dr. Feng Jao, Ohio Northern University
Dr. Lijian Xu, Farmingdale State College
Prof. Marjaneh Issapour, State University of New York, Farmingdale
Phasor Toolbox for AC Circuit Analysis Using MATLAB
Dr. Jai P. Agrawal, Purdue University Northwest
Prof. Omer Farook, Purdue University Northwest
Dr. Wangling Yu, Purdue University Northwest
Promoting Critical Thinking Through Troubleshooting Exercises in Fundamental Electric Circuits Labs
Mr. Joe Delvacario, University of Hartford
Dominick Gerard Lauria, University of Hartford
Dr. Ying Yu, University of Hartford

W423B - A Technology Potpourri II
1:30 p.m. - 3:00 p.m., Room 151 A, Convention Center - Salt Palace
Sponsor: Engineering Technology Division
Moderators: Sidney Martin, Murray State University; Ritu Sharma

Programmable Logic Controllers and Data Traffic Handling Solutions
Dr. David Border, Bowling Green State University
Assessment of Discrete Concept Knowledge, Integrated Understanding, and Creative Problem Solving in Introductory Networking Courses
Prof. Mark J. Indelicato, Rochester Institute of Technology
Dr. Jeanne Christman Ph.D., Rochester Institute of Technology
Prof. George H. Zion, Rochester Institute of Technology
A System Designed to Convert Plastic Waste Produce into Utilitarian Artifacts
Dr. Duong Vu, Duy Tan University-Vietnam
Prof. Ashfaq Ahmed P.E., Purdue University Northwest
Conference Sessions

Wednesday, June 27

YEARS AT THE HEART OF ENGINEERING EDUCATION

Wednesday Conference Sessions

Prof. Omer Farook, Purdue University Northwest
When Emerging Technologies Cross Academic Boundaries: Collaboration or Competition?
Dr. Barbara Christie, Indiana University-Purdue University of Indianapolis
Mr. Joe Tabas, Indiana University-Purdue University of Indianapolis

W424 - Entrepreneurship & Engineering Innovation Division Technical Session 7
1:30 p.m. - 3:00 p.m., Room 355 D, Convention Center - Salt Palace
Sponsor: Entrepreneurship & Engineering Innovation Division
Moderators: Karl Schubert, University of Arkansas; Noelle Comollo, Villanova University

Lessons Learned in the Labyrinth: Navigating Campus Resources to Bring a Student and Faculty Smart Gardening Startup to Life
Dr. Dustyn Roberts P.E., University of Delaware
Mr. Trevor Scott Stephens, University of Delaware

Incorporating Design Thinking into the First-year Engineering Curriculum
Ms. Mary Raber, Michigan Technological University
Ms. Mary Fraley, Michigan Technological University
Ms. Amber Kemppainen, Michigan Technological University

The Engineering-science Intellectual Property (ESIP) Project: A Novel Method for Promoting Innovation
Hamid R. Piroozi J.D., Indiana University-Purdue University of Indianapolis
Dr. Justin L. Hess, Indiana University-Purdue University of Indianapolis
Prof. Charles Feldhaus, Indiana University-Purdue University of Indianapolis

Teaching Entrepreneurial Thinking Through a Companion Course for all Types of Capstone Senior Design Projects
Mrs. Sandra Furnbach Clavijo P.E., Stevens Institute of Technology
Dr. Leslie R. Brunell, Stevens Institute of Technology
Dr. Keith G. Sheppard, Stevens Institute of Technology
Prof. Kishore V. Pochiraju, Stevens Institute of Technology

W426 - Division for Experimentation & Lab-oriented Studies Technical Session 4
1:30 p.m. - 3:00 p.m., Room 254 C, Convention Center - Salt Palace
Sponsor: Experimentation and Laboratory-oriented Studies Division
Moderator: Bridget Smyser, Northeastern University

Design and Implementation of a Course in Experimental Design and Technical Writing
Dr. Natasha Smith P.E., University of Virginia
Dr. Andrew Jason Hill, University of Southern Indiana
Dr. Tom McDonald, University of Southern Indiana

No-cost Implementation of Electronic Lab Notebooks in an Intro

Engineering Design Course
Dr. Daisuke Aoyagi, California State University, Chico
Using Mechatronics to Develop Self Learners and Connect the Dots in the Curriculum
Dr. Robert J. Rabb P.E., The Citadel
Dr. Nathan John Washuta, The Citadel

Coleman D. Floyd

Design of a Cross-curricular Circuits Laboratory Experiment
Mr. William Michael Delaney, University of Portland
Dr. Heather Dillon, University of Portland
Dr. Joseph P. Hoffbeck, University of Portland
BYOE: Activities to Map Intuition to Lumped System Models
Raina White, Dartmouth College
Dr. Christopher G. Levey, Dartmouth College
Dr. Laura Ray, Dartmouth College

W429 - IED Technical Session: Preparing Courses for the Future
1:30 p.m. - 3:00 p.m., Room 255 F, Convention Center - Salt Palace
Sponsor: Industrial Engineering Division
Moderator: Justin Kile, Quinnipiac University

A Gamification Approach for Experiential Education of Inventory Control
Dr. Gokhan Egilmez, University of New Haven
Dr. Ridvan Gedik, University of New Haven

Designing a Converged Plant-wide Ethernet/IP Lab for Hands-on Distance Learning: An Interdisciplinary Graduate Project
Dr. John Pickard, East Carolina University
Dr. Jimmy Bill Linn
Ms. Tolulope B. Awojana, East Carolina University
Dr. Philip J. Lunsford II, East Carolina University

Immersive Virtual Training Environment for Teaching Single- and Multi-queuing Theory: Industrial Engineering Queuing Theory Concepts
Dr. Michael Andre Hamilton, Mississippi State University
Dr. Raed Jaradat, Mississippi State University
Mr. Parker Jones, Mississippi State University
Dr. Emily S. Wall, Mississippi State University

Mr. Vidanelage Lakshika Dayarathna, Mississippi State University
Dr. Debisree Ray, Mississippi State University
Ms. Ginnie Shih En Hsu

Mastery Learning and Assessment Approach in Operations Research Course
Dr. Omar Ashour, Pennsylvania State University

Simpson’s Paradox and Equity in a Classroom: When Dropping the Worst Homework is Prejudicial to Your Students
Dr. Javier Rubio-Herrero, St. Mary’s University, San Antonio

W432 - Challenges for Engineering Educators on the Background of Changed Work Tasks of Engineers in the Modern Working World

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Conference Sessions

Wednesday, June 27

1:30 p.m. - 3:00 p.m., Room 258, Convention Center - Salt Palace
Sponsor: International Division
Speakers: Hanno Hortsch, IGIP; Prof. Michael E. Auer, IAOE; Dr. Phillip Albert Sanger, Purdue University, West Lafayette
Structure of the workshop:
Duration: 90 minutes
Part 1
Prof. Dr. Michael Auer
Historic and current reasons for an IGIP Prototype Curriculum for Engineering Educators.
Prof. Dr. Hanno Hortsch
Organizational and didactic influences for necessary changes to the education and training of engineering educators.
Part 2: Roundtable Discussion
Theme: Institutionalization of engineering pedagogical education—challenges and visions.
Moderator: Prof. Hortsch

W434 - Maps, Metaphors, Tweets, and Drafts
1:15 p.m. - 3:00 p.m., Room 151 D, Convention Center - Salt Palace
Sponsor: Liberal Education/Engineering & Society Division
Moderator: John Brocato, Mississippi State University

Undergraduate Engineering Students’ Use of Metaphor in Presenting Prototypes to a Technical and Non-technical Public Audience
Mr. Jared David Berezin, Massachusetts Institute of Technology
Refining Concept Maps as Method to Assess Learning Outcomes Among Engineering Students
Dr. Sean Michael Ferguson, University of Virginia
Dr. Rider W. Foley, University of Virginia
Mr. John Kofi Eshirow Jr.
Miss Catherine Claire Pollack, University of Virginia
Improving Senior Design Proposals Through Revision by Responding to Reviewer Comments
Prof. Judy Randi, University of New Haven
Dr. Ronald S. Harichandran, University of New Haven
Dr. Joseph A. Levert P.E., University of New Haven
Dr. Bijan Karimi, University of New Haven
Improving Senior Design Proposals Through Revision by Classical Rhetoric and the Political Tweet
Dr. Caroline Carvill, Rose-Hulman Institute of Technology
Dr. Anneliese Watt, Rose-Hulman Institute of Technology

W436 - Postcard Session: Materials Division
1:30 p.m. - 3:00 p.m., Room 260 B, Convention Center - Salt Palace
Sponsor: Materials Division
Moderator: Matthew Cavalli, Western Michigan University
Speakers: Dr. Alison K Polasik, Ohio State University; Dr. Susan P. Gentry, University of California, Davis; Dr. Rachel Koh, Lafayette College; Jacob Bishop, University of Nebraska at Kearney; Dr. Jeffrey Scott Bates, University of Utah; Dr. Cindy Waters, North Carolina A&T State University; Ms. Nicole Johnson-Glauch
This postcard session is intended to report important educational innovations and current research efforts. Authors will describe their work with a two-slide overview in five minutes or less. In the second half of the session, attendees will have the opportunity to talk with the authors.

The focus of this postcard session in the materials division is on curricular innovations and works in progress.

W438 - Mechanical Engineering Division
Technical Session 9
1:30 p.m. - 3:00 p.m., Room 252, Convention Center - Salt Palace
Sponsor: Mechanical Engineering Division
Moderator: Diane Peters, Kettering University

Good Practices in Finite Element Method with a Frequency Analysis Example
Dr. Luis E. Monterrubio, Robert Morris University
An Integrated Active Learning Approach for Understanding Fatigue Theory
Dr. Xiaobin Le P.E., Wentworth Institute of Technology
Prof. Richard L. Roberts, Wentworth Institute of Technology
Prof. Anthony William Duva P.E., Wentworth Institute of Technology
Mr. Herb Connors
Uniaxial Tension Testing Lab: Fewer Instructions for Better Results?
Dr. Hadas Ritz, Cornell University
Prof. Meredith N. Silverstein, Cornell University
Prof. Nelly Andarawis-Puri, Cornell University
Machine Design: Different Pedagogical Approaches to Achieve Targeted Outcomes
Dr. Robert Scott Pierce P.E., Western Carolina University
Dr. Rungun Nathan, Pennsylvania State University, Berks Campus
Dr. William E. Howard, East Carolina University
Dr. Brian Sylcott, East Carolina University
Designing 3D Printed Heat Exchangers in a Senior-level Thermal Systems Course
Dr. Gregory J. Michna, South Dakota State University
Dr. Todd Letcher, South Dakota State University

W441 - Engineering in a Societal Context
1:30 p.m. - 3:00 p.m., Room 155 A, Convention Center - Salt Palace
Sponsor: Multidisciplinary Engineering Division
Moderators: Farshid Zabihian, California State University, Sacramento; Joshua Gargac, University of Mount Union

Peace Engineering: Investigating Multidisciplinary and Interdisciplinary Effects in a Team-based Course About Drones
Dr. Elizabeth A. Reddy, University of San Diego
Dr. Gordon D Hoople, University of San Diego
Prof. Austin Choi-Fitzpatrick, University of San Diego
Dr. Michelle M. Camacho, University of San Diego

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W445 - Business Meeting
1:30 p.m. - 3:00 p.m., Room 250 A, Convention Center - Salt Palace
Sponsors: Engineering Physics and Physics Division; Mathematics Division
The Engineering Physics and Physics Division and Math Division joint business meeting, with an invited speaker on an interesting current topic related to engineering education.

W447 - Student Division Technical Session 2
1:30 p.m. - 3:00 p.m., Room 355 F, Convention Center - Salt Palace
Sponsor: Student Division

Soft Skills Boot Camp: Designing a Three-day Student-run Seminar and Workshop Series for Graduate Students
Ms. Shelby Buffington, Syracuse University
Dr. Ryan L. Falkenstein-Smith, Syracuse University
Mr. Alexander Johnson, Syracuse University
Katy Pieri, Syracuse University
Mr. Alex Vincent Jannini, Syracuse University

Small-scale Intelligent Vehicle Platform for Future Controls Course in the Application of Advanced Driving Assistance Systems
Sarah De Rosier, California Polytechnic State University, San Luis Obispo
Dominic Emilio Riccoboni, California Polytechnic State University, San Luis Obispo
Mr. Paul Michael Rothhammer-Ruiz, California Polytechnic State University, San Luis Obispo
Dr. Charles Birdsong, California Polytechnic State University, San Luis Obispo

Teaching an Undergraduate Flight Dynamics Class for Three Semesters During Ph.D. Studies to Prepare for an Academic Career

Mr. Dipanjan Saha, Texas A&M University
Re-envisioning the Role of the Engineering Education Chapter at a Research-I Institution: Lessons from a Cross-disciplinary Model
Beau Vezino, University of Arizona
Mr. Alexander M Alvarez, University of Arizona Department of Biomedical Engineering
Mr. Byron Hempel, University of Arizona
Ms. Christina Julianne Loera, University of Arizona
Samantha Davidson, University of Arizona
Ms. Savannah Boyd, University of Arizona
Dr. Vignesh Subbian, University of Arizona
improve the maturing of SE practitioners
- Models to transfer knowledge across engineering domains
- Building systems thinking skills in K-12 education using interactive gaming technology
- Real-world examples of adapting traditional courses to embed a systems engineering mindset

**W451 - Women in Engineering Division Technical Session 5**
1:30 p.m. - 3:00 p.m., Room 150 D, Convention Center - Salt Palace
**Sponsor:** Women in Engineering Division
**Moderator:** Rachelle Reisberg, Northeastern University

- Peer Mentoring of Undergraduate Women in Engineering as a Mechanism for Leadership Development
  - Ms. Kristin E. Sherwood, Stony Brook University
  - Dr. Angela M. Kelly, Stony Brook University
  - Dr. Monica Bugallo, Stony Brook University

- Probing Correlations Between Undergraduate Engineering Programs' Customizability and Gender Diversity
  - Dr. Marissa H. Forbes, University of Colorado Boulder
  - Dr. Angela R. Bielefeldt, University of Colorado, Boulder
  - Dr. Jacquelyn F. Sullivan, University of Colorado, Boulder
  - Dr. Ray Lynn Littlejohn

- The Influence of Preconceptions, Experience, and Gender on Use of Supplemental Instruction and Academic Success in a Freshman Chemistry Course for Engineers
  - Mr. Tyler Byrne Cole, Northeastern University
  - Ms. Emma Kaeli, Northeastern University
  - Mr. Bradley Joseph Priem, Northeastern University
  - Ms. Caroline Ghiyo, Northeastern University
  - Dr. Paul A. DiMilla, Northeastern University
  - Ms. Rachelle Reisberg, Northeastern University

- The Power of Peer Mentoring of Undergraduate Women in Engineering: Fostering Persistence through Academic and Social Integration
  - Dr. Jennifer A. Gatz, Stony Brook University
  - Dr. Angela M. Kelly, Stony Brook University
  - Dr. Monica Bugallo, Stony Brook University

Responding to social and environmental problems in a majority world context requires the implementation of different strategies where the engineer and the local community come together. Learning from different points of view and taking into account the perception of the users in any design process is key to ensuring community empowerment, as it opens paths for alliances and solutions that are attached to the local reality. This session presents the experiences of engineering educators from Colombia regarding research, entrepreneurship, and education that are connected to community engagement.

**W480 - Faculty Development Work-in-Progress Poster Session**
1:30 p.m. - 3:00 p.m., Room 151 E, Convention Center - Salt Palace
**Sponsor:** Faculty Development Constituency Committee
**Moderator:** Stephanie Cutler, Pennsylvania State University, University Park

- Risks and Challenges in the Implementation of a Higher Education Program (PEAMA) in the Rural Community of Nazareth-Sumapaz Colombia
  - Ing. Hernán Gustavo Cortés-Mora, Universidad Nacional de Colombia
  - Prof. Jose Ismael Pena Reyes, Universidad Nacional de Colombia
  - Mr. Jairo Andrés Peña, Universidad Nacional de Colombia
  - Nicolás Gaitán-Altarrazón, Universidad Nacional de Colombia
  - Prof. Joana Carolina Chaves Vargas

- Regional Innovation Cluster: The Role of the Entrepreneurship as a Tool for Closing the Gap Between Engineering Education and the Challenges of the Local Communities
  - Miss Diana Duarte, Distancia Cero
  - Mr. David Leonardo Osorio, Distancia Cero
  - Miss Carolina González Barahona, Distancia Cero
  - Prof. Sandra Milena Melo Perdomo
  - Dr. Juan C. Lucena, Colorado School of Mines

- Engagement in Practice: Co-creation Process in Higher Education Contexts to Innovate in Pre-calculus Curriculum
  - Dr. Martha Janneth Salinas S, Minuto de Dios University Corporation
  - Ing. Viviana Garzon, Universidad Minuto de Dios
  - Ing. Ivan Dario Garcia P.E., Universidad Minuto de Dios
  - Miguel Gonzalez, Universidad Minuto de Dios

- Contexts for Active Learning for Engineering Engagement in Practice: Co-creation Process in Higher Education
  - Dr. Ray Lynn Littlejohn
  - Dr. Marissa H. Forbes, University of Colorado Boulder

**W452 - Humanitarian Engineering, Social Entrepreneurship, and Communitarian Innovation in the Global South**
1:30 p.m. - 3:00 p.m., Room 253 B, Convention Center - Salt Palace
**Sponsor:** Community Engagement Division
**Moderators:** James Huff, Harding University; Juan Lucena, Colorado School of Mines
**Speakers:** Dr. Juan C. Lucena, Colorado School of Mines; Mr. Hernán Gustavo Cortés-Mora; Mr. Camilo Andrés Navarro Forero P.E.; Miguel Gonzalez, Corporacion Universitaria Minuto de Dios

To encourage a more interactive discussion of work-in-progress papers submitted to the Faculty Development Constituency Committee, papers will be presented as a poster session. Authors will be available to discuss their projects with colleagues to help encourage collaboration and generate ideas for moving everyone's projects forward.

**Faculty Development Program on Active Learning for Engineering Faculty in Chile: Sharing Steps**
- Prof. Angeles Domínguez, Tecnologico de Monterrey, Mexico and Universidad Andres Bello, Santiago
- Prof. Maria Elena Truyol, Universidad Andres Bello
- Prof. Genaro Zavaleta, Tecnologico de Monterrey, Mexico and Universidad Andres Bello, Santiago

Schedule subject to change: Please go to www.asee.org/icp for up to date information
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Conference Sessions

Wednesday, June 27

Work in Progress: Coaching as a Midcareer Faculty Development Approach
Dr. Heidi M. Sherick, University of Michigan

Work in Progress: Collaborating with Faculty Development in Retention Improvement
Dr. Amy B. Chan Hilton, University of Southern Indiana

Work in Progress: Engineering Student Instructors, What Are Their Needs and How Can We Best Prepare Them?
Dr. Tershia A. Pinder-Grover, University of Michigan
Dr. Stephanie Marie Kusano, University of Michigan
Dr. Grenmarie Agresar, University of Michigan

Work in Progress: Promoting Group Work for Learning: Student Characterizations of Exemplary Project Group Members
Dr. Jim L. Borgford-Parnell, University of Washington
Dr. Ken Yasuhara, University of Washington
Kamal Abdulla Ahmed, University of Washington
David Schipf, University of Washington

W493B - ASEE Nominating Committee
1:30 p.m. - 3:00 p.m., Room 251 A, Convention Center - Salt Palace
Sponsor: ASEE Board of Directors
ASEE Nominating Committee.

W496A - ASEE 2019 Program Chair Orientation
1:30 p.m. - 3:00 p.m., Room 150 C - Sponsor Tech Room, Convention Center - Salt Palace
Sponsor: ASEE Headquarters
Orientation to introduce new program chairs to Monolith and the process and procedures for managing papers and sessions for the 2019 ASEE Annual Conference in Tampa, Florida. This meeting is conducted by the Conferences Director for ASEE HQ. We strongly encourage any first-time program chairs to attend. Continuing program chairs are also encouraged to attend. We welcome your feedback and good ideas.

W496B - CIEC Board Meeting
1:15 p.m. - 3:45 p.m., Room 251 B, Convention Center - Salt Palace
Sponsor: ASEE Headquarters
CIEC Board Meeting

W596B - International Forum: International Panel
1:30 p.m. - 4:45 p.m., Salon F, HQ Hotel - Marriott at City Creek
Sponsor: ASEE Headquarters
Moderator: Vinod Lohani, Virginia Tech
Engineering education: opportunities and challenges at the global level.

W505 - Novel Classrooms
3:15 p.m. - 4:45 p.m., Room 151 A, Convention Center - Salt Palace
Sponsor: Chemical Engineering Division
Moderator: Daniel Anastasio, Rose-Hulman Institute of Technology
These presentations highlight novel chemical engineering courses or classroom environments.

A Graduate Student Pedagogy Seminar in Chemical Engineering

Dr. Christina Smith, Brown University
Ann Sitomer, Portland State University
Dr. Milo Koresky, Oregon State University

BioEngineering Lab Techniques: A Novel Lab Course for Protein Expression in Bacterial and Mammalian Cells
Dr. Jacob James Elmer, Villanova University
Dr. Andre Palmer, Ohio State University
Prof. Jessica O. Winter P.E., Ohio State University

Just the Flippin’ FAQs
Dr. Julie L. P. Jessop, University of Iowa
Dr. Anna L. Flaming, University of Iowa

Students’ Responses to Professionally Contextualized Activities in a Studio Class
Mr. Ayman M. Alabdullatif, Oregon State University
Mr. Shane Paul Lorona, Oregon State University
Dr. Milo Koresky, Oregon State University

W506 - Accreditation and the BOK
3:15 p.m. - 4:45 p.m., Room 251 C, Convention Center - Salt Palace
Sponsor: Civil Engineering Division
Moderators: Norman Dennis, University of Arkansas; Allen Estes, California Polytechnic State University, San Luis Obispo

Lessons Learned from the First Round of Course Assessments After Curriculum Restructure Based on ASCE BOK2
Dr. Kelly Brumbelow, Texas A&M University
Dr. Luciana R. Barroso, Texas A&M University
Dr. Debra Fowler, Texas A&M University
Dr. James Michael Kaihatu, Texas A&M University
Miss Veronica S. Rodriguez Charvarria

The Impact of EAC-ABET Program Criteria on Civil Engineering Curricula
Dr. Brian J. Swenty P.E., University of Evansville
Dr. Matthew K. Swenty, Virginia Military Institute

Enhancing Student Learning Through Accreditation
Dr. Ronald W. Welch, The Citadel
Dr. Tara Horner, The Citadel
Dr. Robert J. Rab P.E., The Citadel
Dr. Kevin C. Bower P.E., The Citadel

Industry Partnerships Assist Programs for Accreditation
Dr. Ronald W. Welch, The Citadel
Dr. Robert J. Rab P.E., The Citadel
Dr. Kevin C. Bower P.E., The Citadel

Perceptions of the Civil Engineering Body of Knowledge Outcomes by Senior Students: Effect of Activities, Internships, and Career Goals
Dr. Angela R. Bielefeldt, University of Colorado, Boulder

What Do First-year and Senior Civil Engineering Students Think About Raising the Bar on the Education Requirements for Professional Licensure?
Dr. Angela R. Bielefeldt, University of Colorado, Boulder

Schedule subject to change: Please go to www.asee.org/icp for up to date information
W5112A - Action on Diversity - Safe Zone Deep Dive: Supporting Transgender Students and Colleagues

3:15 p.m. - 4:45 p.m., Room 150 E, Convention Center - Salt Palace
Sponsors: ASEE Diversity Committee; International Division; Minorities in Engineering Division
Moderator: Rocio Chavela Guerra, American Society for Engineering Education
Speakers: Dr. Rocio Chavela Guerra, American Society for Engineering Education; Mr. Christopher Alexander Carr, National Society of Black Engineers; Dr. Linda Vanasupa, California Polytechnic State University, San Luis Obispo; Dr. Stephanie Farrell, Rowan University

(Tickets are requested for planning purposes only! Please come even if you do not sign up in advance.)

Did you know…

• 1 in 5 LGBTQIA+ students fear for their physical safety on college campuses?
• 1 in 3 LGBTQIA+ students are made to feel uncomfortable in our classrooms?
• LGBTQIA+ engineering students are more likely than women, underrepresented minorities, and non-LGBTQ peers to report a chilly climate
• STEM departments are lagging way behind other disciplines in the adoption of LGBTQIA+-inclusive practices

You can help change this! Safe Zone Ally Training is a series of interactive workshops for students, faculty and the professional community, during which participants will build the knowledge and skills needed to create a more inclusive and affirming environment for LGBTQIA+ individuals in engineering. The workshops have been developed by a community of science and engineering professionals and students, specifically for a STEM audience.

Safe Zone Level 1 focuses on understanding LGBTQIA+ concepts and the coming out process, responding to bias, and adopting simple strategies for building an inclusive environment.

Safe Zone Level 2 discusses aspects of engineering culture that act as barriers to LGBTQIA+ equality and explore heterosexual and cisgender privilege. Participants learn to recognize bias and disrupt discrimination.

The Deep Dive LGBTQIA+ Inclusion workshop focuses on creating a supportive and inclusive environment for transgender students and colleagues.

Participants in Levels 1 and 2 will receive a Safe Zone sticker to display in their workplace. Digital badges will be awarded for participation in each workshop in the Safe Zone series.

Free ticketed event.

W514 - Problem Solving, Adaptive Expertise, and Social Engagement

3:15 p.m. - 4:45 p.m., Room 155 B, Convention Center - Salt Palace
Sponsor: Educational Research and Methods Division
Moderators: Elizabeth Cady, National Academy of Engineering; Samantha Brunhaver, Arizona State University, Polytechnic campus

Educational Research and Methods Division Technical Session

W514B - Assessment and Research Tools

3:15 p.m. - 4:45 p.m., Room 151 G, Convention Center - Salt Palace
Sponsor: Educational Research and Methods Division
Moderators: Nicole Johnson-Glauch; Dominik May, University of Georgia

Educational Research and Methods Division Technical Session

Many Hands on the Elephant: How a Transdisciplinary Team Assesses an Integrative Course
Dr. David DiBiasio, Worcester Polytechnic Institute

Many Hands on the Elephant: How a Transdisciplinary Team Assesses an Integrative Course
Dr. David DiBiasio, Worcester Polytechnic Institute
Conference Sessions

Wednesday, June 27

YEARS AT THE HEART OF ENGINEERING EDUCATION

125 YEARS AT THE HEART OF ENGINEERING EDUCATION

Conference Sessions

Kristin Boudreau, Worcester Polytechnic Institute
Dr. Leslie Dodson, Worcester Polytechnic Institute
Ms. Paula Quinn, Worcester Polytechnic Institute
Prof. John Bergendahl, Worcester Polytechnic Institute
Prof. John M. Sullivan Jr, Worcester Polytechnic Institute
Glenn R. Gaudette, Worcester Polytechnic Institute
Dr. Curtis Abel, Worcester Polytechnic Institute
Ms. Laura A. Robinson, Worcester Polytechnic Institute
Prof. Sarah Wodin-Schwartz, Worcester Polytechnic Institute

Creating a Concept Inventory - Lessons Learned
Dr. Nancy E. Study, Pennsylvania State University, Erie
Dr. Steven Nozaki, Pennsylvania State University, Erie
Dr. Sheryl A. Sorby, University of Cincinnati
Dr. Mary A. Sadowski, Purdue University, West Lafayette
Heidi M. Steinhauser, Embry-Riddle Aeronautical Univ., Daytona Beach
Ronald L. Miller, Colorado School of Mines
Capturing Narratives of Graduate Engineering Attrition Through Online Forum Mining
Carey Whitehair
Dr. Catherine G.P. Berdanier, Pennsylvania State University, University Park

First Approach to Purposeful Sampling for Determining Key Factors on Outcome Bias
Dr. Mariana Tafur-Arciniegas, Universidad de los Andes
Andres Felipe Lara Contreras, Universidad de los Andes

Software-hardware Integration of System Design Discipline
Dr. Wangling Yu, Purdue University Northwest
Prof. Omer Farook, Purdue University Northwest
Dr. Jai P. Agrawal, Purdue University Northwest
Prof. Asfiaq Ahmed P.E., Purdue University Northwest

Selecting Estimating Software: Perspectives from the Construction Industry
Dr. Charles McIntyre, Indiana University-Purdue University of Indianapolis
Sanjeev Adhikari, Indiana University-Purdue University of Indianapolis
Mr. Veto Matthew Ray, Indiana University-Purdue University of Indianapolis
Mr. James W. White, Indiana University-Purdue University of Indianapolis

How to Mine NCES Reports for Hidden Treasures
Dr. Barry Dupen, Purdue University, Fort Wayne

A Multiplayer Peer-to-Peer Cyber Attack and Defense Infrastructure
Mr. Wesley Allen Hotalen Jr., ECU Department of Technology Systems
Dr. Te-Shun Chou, East Carolina University

W517 - Engineering & Public Policy Division ABET Session
3:15 p.m. - 4:45 p.m., Room 260 A, Convention Center - Salt Palace
Sponsor: Engineering and Public Policy Division
EPPD ABET session.

W521 - ELD Extended Executive Council
3:15 p.m. - 4:45 p.m., Room 250 A, Convention Center - Salt Palace
Sponsor: Engineering Libraries Division
This session is used by division leaders to review the conference and division activities as well as to begin planning for next year.

W523A - ETD Strategic Planning
3:15 p.m. - 4:45 p.m., Room 250 B, Convention Center - Salt Palace
Sponsor: Engineering Technology Division
Annual strategy meeting.

W523B - Computer-related Issues
3:15 p.m. - 4:45 p.m., Room 151 B, Convention Center - Salt Palace
Sponsor: Engineering Technology Division
Moderators: Barry Lunt, Brigham Young University; Mary Johnson, Purdue Polytechnic Institute

W530 - Topics in Computing and Information Technology-III
3:15 p.m. - 4:45 p.m., Room 151 E, Convention Center - Salt Palace
Sponsor: Computing and Information Technology Division
Moderator: Scott Kaiser, Utah Valley University

Virtual Reality Implementation of a Scanning Electron Microscope in Nanotechnology Education
Landon A. Braden
Scott Alexander Kaiser, Utah Valley University
Dr. Reza Kamali-Sarvestani, Utah Valley University
Afzaneh Minaie, Utah Valley University
Dr. Paul Weber, Utah Valley University

Magnitude Museum: Game-based Learning for Nanosizes, Dimensions, and Nanotechnology Terminology
Dr. Reza Kamali-Sarvestani, Utah Valley University
Brian Durney, Utah Valley University

Work in Progress: Designing Laboratory Work for a Novel Embedded AI Course
Mehmet Ergizer, Wentworth Institute of Technology
Bryon Kucharski, Wentworth Institute of Technology
Prof. Aaron Carpenter, Wentworth Institute of Technology

W534 - Embedding Sociotechnical Systems Thinking II
3:15 p.m. - 4:45 p.m., Room 151 F, Convention Center - Salt Palace
Sponsor: Liberal Education/Engineering & Society Division
Moderator: Bernd Steffensen, University of Applied Sciences Darmstadt

Measuring the Impact of an Interdisciplinary Experiential-learning
Activity on Student Learning  
Dr. Anne-Marie Nickel, Milwaukee School of Engineering  
Dr. Jennifer Kelso Farrell, Milwaukee School of Engineering  
Dr. Alicia Domack, Milwaukee School of Engineering  
Ms. Gina Elizabeth Mazzone, Milwaukee School of Engineering  

Exploring the Human Dimension of Engineering Through the Built Environment  
Dr. Jeffrey C. Evans P.E., Bucknell University  

W545 - Panel Discussion: ABET Accreditation for Engineering Physics
3:15 p.m. - 4:45 p.m., Room 150 D, Convention Center - Salt Palace
Sponsor: Engineering Physics and Physics Division
Moderators: Baha Jassemnejad, ASRC Federal System Solutions, Federal Aviation Administration; James O’Brien, Wentworth Institute of Technology
Speakers: Dr. Stephen Cobb P.E., Murray State University; Dr. Evan C. Lemley, University of Central Oklahoma; Dr. Baha Jassemnejad, ASRC Federal System Solutions, Federal Aviation Administration; Dr. Bala Maheswaran, Northeastern University

W551 - Women in Engineering Division Technical Session 6
3:15 p.m. - 4:45 p.m., Room 254 C, Convention Center - Salt Palace
Sponsor: Women in Engineering Division
Moderator: Judith Pasek, University of Wyoming

Coding for Culture, Diversity, Gender, and Identity: The Potential for Automation in Research  
Ms. Chloe Wiggins, Designing Education Lab  
Dr. Sheri Sheppard, Stanford University  
Dr. Shannon Katherine Gilmartin, SKG Analysis  
Mr. Benedikt von Unold, Stanford University  
Dr. Tua A. Björklund, Aalto University Design Factory  
Michael Arruza Cruz  

Illuminating the Computing Pathway for Women in Mississippi  
Dr. Vemitra M. White, Mississippi State University  
Dr. Sarah B. Lee, Mississippi State University  
Ms. Litany H. Lineberry, Mississippi State University  

Dr. Jessica Ivy, Mississippi State University  
Ms. C. Danielle Grimes, Mississippi State University  

Pre-college and In-college Experiences that Contribute to Women Selecting and Persisting through STEM and Arts Majors at an Undergraduate Institution  
Capt. Allison Webster-Giddings, Vanderbilt University  
Ms. Nancy Dickson, Vanderbilt  
Dr. Melissa S. Martiros, Anna Maria College  
Ms. Sarah Mullen, Vanderbilt University  

W552 - Holistic Assessment and Teaching in Service-learning Environments
3:15 p.m. - 4:45 p.m., Room 258, Convention Center - Salt Palace
Sponsor: Community Engagement Division
Moderator: Ed Kirtley, Oklahoma State University

A Pilot Study of the Development of Empathy Within a Service-learning Trip from a Qualitative Perspective  
Linjue Wang, Ohio State University  
Mr. Turhan Kendall Carroll, Ohio State University  
Dr. David A. Delaine, Ohio State University  

Bringing Sustainable Development Challenges into the Engineering Classroom: Applying Human-centered Design Protocols to Artisanal and Small-scale Mining  
Dr. Nicole M. Smith, Colorado School of Mines  
Benjamin A. Teschner, Colorado School of Mines  
Prof. Robin Bullock, Colorado School of Mines  

Developing an Evaluation Tool to Examine Motivational Factors of Non-student Community Partnership Participants  
Dr. Julia D. Thompson, San Jose State University  
Dr. Jinny Rhee, San Jose State University  

Occupational Therapy Boards – Identifying the Value of a High-impact Service-learning Project  
Dr. Todd France, Ohio Northern University  

Outreach Potential of Displaying Research Artifacts in Art Museums  
Dr. Larry L. Howell, Brigham Young University  
Dr. Spencer P. Magleby, Brigham Young University  
Ms. Terri Christiansen Bateman, Brigham Young University  
Prof. David C. Morgan, Brigham Young University  
Prof. Denise Marie Halverson

Lynda Palma, Brigham Young University Museum of Art
**W596 - ASEE New Officers' Orientation**
3:15 p.m. - 4:45 p.m., Room 251 A, Convention Center - Salt Palace  
**Sponsor:** ASEE Headquarters

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**W793A - President's Farewell Reception and International Forum Poster Presentations**  
**Sponsored by Dassault Systèmes**
6:00 p.m. - 7:30 p.m., Grand Ballroom A-H, Convention Center - Salt Palace  
**Sponsor:** ASEE Board of Directors  
Join your friends and colleagues as we say farewell to Salt Lake City and ASEE President Bevlee Watford while passing the gavel to President-Elect Stephanie Farrell and looking forward to Tampa, Florida, site of the 2019 Annual Conference & Exposition. This session will also feature the poster board presentations from the International Forum.

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**W793B - ASEE Presidents International Forum Reception (Invite Only)**
7:30 p.m. - 8:30 p.m., Offsite, Presidential Suite, Hilton Salt Lake City  
**Sponsor:** ASEE Board of Directors  
Free ticketed event.

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**W796 - International Reception—By Invite Only**
8:00 p.m. - 9:30 p.m., Offsite, Presidential Suite, Hilton Salt Lake  
**Sponsor:** ASEE Headquarters
International reception—by invite only. Hosted by 2019 ASEE president, Stephanie Farrell.
Presenters are listed in alphabetical order, followed by their session numbers. An asterisk (*) before a session number indicates that the presenter has published a related paper in the conference proceedings. A plus (+) before a session number indicates that the paper has received a nomination for best paper.

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<td>R193A</td>
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### ASEE Diversity Committee

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<tr>
<td>U4112A</td>
<td>Action on Diversity - Safe Zone Ally Training (Level 1)</td>
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<tr>
<td>U4112B</td>
<td>Perspectives on Diversity, Equity, and Inclusion Beyond the Undergraduate Years</td>
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<tr>
<td>U5112A</td>
<td>Expanding Diversity, Equity, and Inclusion in Engineering Cultures from a Theoretical Perspective</td>
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<tr>
<td>M3112A</td>
<td>Action on Diversity - Safe Zone Ally Training (Level 2)</td>
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### Sponsoring Groups

- **M3112B**: Building and Engaging Communities for Scholarship, Advocacy, and Action for Diversity, Equity, and Inclusion
- **M4112**: Action on Diversity - Best Diversity Paper Finalists
- **M5112A**: Impacts of Sexual Harassment in Academic Science, Engineering, and Medicine
- **T1112**: Action on Diversity - Safe Zone Ally Training (Level 1)
- **T4112**: Understanding Diversity, Equity, and Inclusion from Students’ Perspectives
- **T5112A**: Action on Diversity - Safe Zone Ally Training (Level 2)
- **T580**: Engineering Inclusive Teaching Classrooms: a Professional Development Workshop
- **W1112A**: Revealing the Invisible: Engineering Course Activities that Address Privilege, Isms, and Power Relations (Interactive Session)
- **W2112**: DISTINGUISHED LECTURE: A Voice for Change - Building an Inclusive Future with Local Policy and Engineers
- **W3112A**: Creating Equity Through Structure and Pedagogy
- **W4112A**: Action on Diversity - Round Table Conversations on Diversity, Equity, and Inclusion
- **W5112A**: Action on Diversity - Safe Zone Deep Dive: Supporting Transgender Students and Colleagues

### ASEE Global Programs

#### ASEE Headquarters

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| M97C  | HQ Staff Office                                      |
| M197  | Pearson Meeting Room & Focus Group                   |
| M597  | Tuesday Plenary Rehearsal                             |
| T97A  | Executive Director's Office - Tuesday                |
| T97B  | HQ Staff Office                                      |
| W197A | ASEE Staff Office - Wednesday                        |
| W197B | Executive Director's Office - Wednesday              |
| W197C | HQ Staff Office                                      |

### Academy of Fellows

- T192: A cademy of Fellows Breakfast

### Aerospace Division

- U401: Aerospace Division Technical Session
- M301: Aerospace Division Technical Session 1
- M401: Panel Discussion
- M534: 2018 Interdivisional Town Hall Meeting: Who's in the Driver's Seat of Engineering Education?
- T601: Aerospace Division Business Meeting
- T701: Aerospace Division Wine and Dine
- W101A: Bus Tour to Hill Aerospace Museum
- W334A: Meeting for Incoming/Current Program Chairs and Division Chairs
- W401: Aerospace Division Technical Session 2

### Architectural Engineering Division

- U402: Architectural Division Technical Session
- U509: Sponsor Technical Session: Using Technology to Teach the Next Generation—Presented by Procore
- M402: Architectural Division Technical Session 1
- M502: Architectural Division Technical Session 2
- M534: 2018 Interdivisional Town Hall Meeting: Who's in the Driver's Seat of Engineering Education?
- T402: Architectural Division Business Meeting
- T596A: Non-tenure Track Faculty Leadership Roundtable
- T709: Social Event for the Construction and Architectural Divisions
- W334A: Meeting for Incoming/Current Program Chairs and Division Chairs

### Awards Policy Committee

### Biological and Agricultural Engineering Division

- M403: Biological & Agricultural Division Technical Session 1
- M503: Biological & Agricultural Division Technical Session 2
- M534: 2018 Interdivisional Town Hall Meeting: Who's in the Driver's Seat of Engineering Education?
- T103: Biological and Agricultural Business Meeting
- T496B: 1st Generation/SES Leadership Roundtable
- W334A: Meeting for Incoming/Current Program Chairs and Division Chairs

Schedule subject to change: Please go to www.asee.org/icp for up to date information
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| | | Community Engagement Division |
| | | 2018 Community Service Activity: Community Garden for Salt Lake City Refugees |

Schedule subject to change: Please go to www.asee.org/icp for up to date information
Schedule subject to change: Please go to www.asee.org/icp for up to date information.
125 YEARS AT
THE HEART OF
ENGINEERING
EDUCATION

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T414B  Practice II: Curricular Innovations
T414C  Educational Research and Methods Division Technical Session 19
T414D  Identity and Engineering Education Research: Topics, Issues, Trends
T414E  Works in Progress II
T514A  Progress of the Revolution: NSF RED Projects Overview
T514B  Mentoring Practices and Project Teams
T514C  Practice III: Multimedia Learning
T514D  ERM Business Meeting
T714B  FIE Executive Board
T714  Educational Research and Methods (ERM) Brouhaha
W114A  Active Learning Methods in Action
W114B  Career Decisions and Faculty Development
W114C  Institutional Change
W314  Research Methods
W334A  Meeting for Incoming/Current Program Chairs and Division Chairs
W334B  Curricular Transformation
W414B  Maker Communities and Authentic Problem Solving
W514  Problem Solving, Adaptive Expertise, and Social Engagement
W514B  Assessment and Research Tools
W334A  Meeting for Incoming/Current Program Chairs and Division Chairs

**Electrical and Computer Division**

U216  SUNDAY WORKSHOP: Wind Energy Presentation and Activity for K-20 Outreach
U445A  Energy Innovation and Environmental Impact
M316  Energy Conversion and Conservation Division Technical Session on Solar
M416  Energy Conversion and Conservation Division Best Papers
M5112A  Impacts of Sexual Harassment in Academic Science, Engineering, and Medicine
M516  Annual Business Meeting
M534  2018 Interdivisional Town Hall Meeting: Who's in the Driver's Seat of Engineering Education?
T116  Energy Conversion and Conservation Division Technical Session on Energy Efficiency and Power Grid Security
T416  The Incorporation of Bioenergy in STEM Curricula
T716  Division Dinner at Mazza Middle Eastern Cuisine
W2112  DISTINGUISHED LECTURE: A Voice for Change – Building an Inclusive Future with Local Policy and Engineers
W316  Energy Conversion and Conservation Division Technical Session on Conservation and Optimization
W334A  Meeting for Incoming/Current Program Chairs and Division Chairs
W416  The Latest Research and Pedagogy in Energy Conversion and Conservation

**Engineering Deans Council**

M3102  EDC Executive Board Meeting/Lunch (By Invitation Only)
M4102  EDC Public Policy Committee Meeting (By Invitation Only)
M534  2018 Interdivisional Town Hall Meeting: Who's in the Driver's Seat of Engineering Education?
T1102  EDC Breakfast and Business Meeting Sponsored by University of Florida
T7100  INDUSTRY DAY: Institutional Council Reception Sponsored by NCEES (By Invitation Only)

**Engineering Design Graphics Division**

S118  EDGD Executive Committee Meeting
U218  SUNDAY WORKSHOP: Understanding the Basic Concepts of Engineering Graphics
M318  EDGD: Assessment & Student Learning
M418  EDGD Business Meeting
M534  2018 Interdivisional Town Hall Meeting: Who's in the Driver's Seat of Engineering Education?
T118  EDGD: Potpourri
T318  Engineering Design Graphics Division Poster Session
T518  EDGD: CAD, CAM, and AI
T718  EDGD Awards Dinner and Social
W334A  Meeting for Incoming/Current Program Chairs and Division Chairs

**Engineering Economy Division**

268 Schedule subject to change: Please go to www.asue.org/icp for up to date information
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### Engineering Ethics Division

| M 320  | Engineering Ethics Division Technical Session 1 |
| M 420  | Engineering Ethics Division Technical Session 5 |
| M 5112A| Impacts of Sexual Harassment in Academic Science, Engineering, and Medicine |
| M 520  | Engineering Ethics Division Technical Session 2 |
| M 534  | 2018 Interdivisional Town Hall Meeting: Who's in the Driver's Seat of Engineering Education? |
| T 120  | Engineering Ethics Division Technical Session 3 |
| T 320  | Engineering Ethics Division Poster Session |
| T 411  | Postcard Roundtable: Preparing Co-Op and Internship Students for the Engineering Workforce |
| T 520  | Ethics Division Business |
| W 120  | Engineering Ethics Division Technical Session 4 |
| W 2112 | DISTINGUISHED LECTURE: A Voice for Change - Building an Inclusive Future with Local Policy and Engineers |
| W 220  | DISTINGUISHED LECTURE: It Takes More Than Good Intentions – Do Engineers Have Responsibility for Social In/Justice? |
| W 334A | Meeting for Incoming/Current Program Chairs and Division Chairs |

### Engineering Leadership Development Division

| U 255  | SUNDAY WORKSHOP: Designing Transformational Leadership Programs for Engineering Undergrads |
| U 255B | SUNDAY WORKSHOP: We Survived the Crisis! Using a Multi-Campus Crisis Simulation to Teach Leadership Best Practices - Approaches, Tips, and Techniques to Start, Grow, and Sustain an Engineering Leadership Development Program |
| M 355  | Best Practices - Approaches, Tips, and Techniques to Start, Grow, and Sustain an Engineering Leadership Development Program |
| M 455  | Literature and Research Perspectives on Engineering Leadership Development |
| M 534  | 2018 Interdivisional Town Hall Meeting: Who's in the Driver's Seat of Engineering Education? |
| M 755  | LEAD Division Social |
| T 355  | Poster Session - Engineering Leadership Development Division |
| T 455  | Addressing the Leadership Requirement in New ABET Criteria |
| T 655  | Business Meeting - Engineering Leadership Development Division |
| W 155  | Assessment of Engineering Leadership Development |
| W 334A | Meeting for Incoming/Current Program Chairs and |
|        | Division Chairs |

### Engineering Libraries Division

| U 221  | Sunday Workshop: The Fundamentals of Engineering Librarianship |
| U 421  | Engineering Libraries Division Technical Session 4 |
| U 521  | Engineering Libraries Division Technical Session 2 |
| M 321  | ELD Welcome and Lighting Talks |
| M 5112A| Impacts of Sexual Harassment in Academic Science, Engineering, and Medicine |
| M 534  | 2018 Interdivisional Town Hall Meeting: Who's in the Driver's Seat of Engineering Education? |
| M 721  | ELD Welcome Reception |
| T 121  | ELD Business Meeting |
| T 321  | Engineering Libraries Division Poster Session |
| T 421  | Engineering Libraries Division Technical Session 3 |
| T 721  | ELD Annual Banquet |
| W 121  | Engineering Libraries Division Technical Session 1 |
| W 321  | Engineering Libraries Division Technical Session 5 |
| W 334A | Meeting forIncoming/Current Program Chairs and Division Chairs |
| W 421  | Advice for Mid-Career Librarians |
| W 521  | ELD Extended Executive Council |

### Engineering Management Division

| M 322  | Curriculum and the Classroom |
| M 522  | EMD Business Meeting |
| M 534  | 2018 Interdivisional Town Hall Meeting: Who's in the Driver's Seat of Engineering Education? |
| T 122  | CEMAL Business Meeting |
| T 422  | Past, Present, and Future of EM Education |
| T 455  | A Addressing the Leadership Requirement in New ABET Criteria |
| T 719  | Joint Banquet |
| W 122  | Course Tools and Practices |
| W 322  | Programs and Pedagogies |
| W 334A | Meeting for Incoming/Current Program Chairs and Division Chairs |

### Engineering Physics and Physics Division

| U 245  | SUNDAY WORKSHOP: Projects Based Arduino Activities |
| U 445A | Energy Innovation and Environmental Impact |
| U 445B | Engineering Physics and Physics Division Technical Session 3 |
| M 5112A| Impacts of Sexual Harassment in Academic Science, Engineering, and Medicine |
| M 534  | 2018 Interdivisional Town Hall Meeting: Who's in the Driver's Seat of Engineering Education? |
| M 745  | Engineering and Public Policy Division Social Event |
| T 145  | Engineering Physics and Physics Division Technical Session 2 |

Schedule subject to change: Please go to www.asee.org/icp for up to date information.
T345  Engineering Physics & Physics Division Poster Session
T445  Executive Board Meeting
W334A Meeting for Incoming/Current Program Chairs and Division Chairs
W345  Engineering Physics and Physics Division Technical Session 1
W445  Business Meeting
W545  Panel Discussion: A BET Accreditation for Engineering Physics

**ENGINEERING RESEARCH COUNCIL**
M3103  Building a Research Scholarship Program
M5103  ERC Board and Planning Committee Meeting
T7100  INDUSTRY DAY: Institutional Council Reception Sponsored by NCEES (By Invitation Only)

**ENGINEERING TECHNOLOGY COUNCIL**
U4104  ET National Forum
U5104  ETLI Planning Meeting
M4104  ETC Executive Board Meeting
M7104  McGraw/Berger Awards Banquet
T4104  ETC Business Meeting
T7100  INDUSTRY DAY: Institutional Council Reception Sponsored by NCEES (By Invitation Only)

**ENGINEERING TECHNOLOGY DIVISION**
U4104  ET National Forum
U5104  ETLI Planning Meeting
U523  ET Pedagogy I
M323  ECET Dept Heads Meeting
M423  MET Dept Heads Meeting
M5112A Impacts of Sexual Harassment in Academic Science, Engineering, and Medicine
M523  ETD Executive Board
M523B A Technology Potpourri I
M534  2018 Interdivisional Town Hall Meeting: Who's in the Driver's Seat of Engineering Education?
M7104  McGraw/Berger Awards Banquet
T123  JET Board Meeting
T123B  ETAministrative Issues
T4104  ETC Business Meeting
T423  Tau Alpha Pi Meeting
T423B  Alternative Teaching Methods
T496A  LGBTQIA + Leadership Roundtable
T496B  1st Generation/SES Leadership Roundtable
T496C  Persons with Disabilities Leadership Roundtable
T496D  Military Veterans Leadership Roundtable
T523  ET Projects
T523B  ET Pedagogy II
T596A  Non-tenure Track Faculty Leadership Roundtable
T596B  Graduate Students Leadership Roundtable
T623  ETD Business Meeting
W123  MET and Mechatronics
W123B  ET Peripherals
W334A Meeting for Incoming/Current Program Chairs and Division Chairs
W423A Electrical/Electronic ET Issues
W423B A Technology Potpourri II
W523A ETD Strategic Planning
W523B Computer-related Issues

**ENGINEERING AND PUBLIC POLICY DIVISION**
M317  Engineering and Public Policy
M417  Engineering and Public Policy Division Technical Session 1
M517  Engineering and Public Policy Division Technical Session 2
M534  2018 Interdivisional Town Hall Meeting: Who's in the Driver's Seat of Engineering Education?
T117  Engineering and Public Policy Business Meeting
W334A Meeting for Incoming/Current Program Chairs and Division Chairs
W517  Engineering & Public Policy Division A BET Session

**ENTREPRENEURSHIP & ENGINEERING INNOVATION DIVISION**
U424  Entrepreneurship & Engineering Innovation Division Technical Session 1
U445A Energy Innovation and Environmental Impact
U524  Entrepreneurship & Engineering Innovation Division Technical Session 2
M524  Entrepreneurship & Engineering Innovation Division Technical Session 3
M534  2018 Interdivisional Town Hall Meeting: Who's in the Driver's Seat of Engineering Education?
T124  Entrepreneurship & Engineering Innovation Division Technical Session 4
T424  Entrepreneurship and Engineering Innovation Division Business Meeting
T524  Entrepreneurship & Engineering Innovation Division Technical Session 5
T724  Entrepreneurship and Engineering Innovation Division ENT/KEEN Reception
W124  Entrepreneurship & Engineering Innovation Division Technical Session 6
W324  Entrepreneurship & Engineering Innovation Division Technical Session 7
W334A Meeting for Incoming/Current Program Chairs and Division Chairs
W424  Entrepreneurship & Engineering Innovation Division Technical Session 8

**ENVIRONMENTAL ENGINEERING DIVISION**
U445A Energy Innovation and Environmental Impact
M325  Environmental Engineering Division Technical Session 1
M425  Environmental Engineering Division Technical Session 3
M5112A Impacts of Sexual Harassment in Academic Science,
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**Industrial Engineering Division**
- U429 IED Technical Session: Preparing Programs for the Future
- M529 Industrial Engineering Division Town Hall Business Meeting
- M534 2018 Interdivisional Town Hall Meeting: Who's in the Driver's Seat of Engineering Education?
- T129 IED Technical Session: Preparing Students for the Future
- T329 Industrial Engineering Division Poster Session
- T429 IED Technical Session: Preparing for the Future Through Projects and Research
- T719 Joint Banquet
- W344 Meeting for Incoming/Current Program Chairs and Division Chairs
- W429 IED Technical Session: Preparing Courses for the Future

**Instrumentation Division**
- M431 Instrumentation Division Technical Session 1
- M512A Impacts of Sexual Harassment in Academic Science, Engineering, and Medicine
- M531 Instrumentation Division Technical Session 2
- M534 2018 Interdivisional Town Hall Meeting: Who's in the Driver's Seat of Engineering Education?
- W344 Meeting for Incoming/Current Program Chairs and Division Chairs

**International Division**
- U411A Action on Diversity - Safe Zone Ally Training (Level 1)
- M311A Action on Diversity - Safe Zone Ally Training (Level 2)
- M312A Building and Engaging Communities for Scholarship, Advocacy, and Action for Diversity, Equity, and Inclusion
- M341 International Division Annual Meeting
- M411A Action on Diversity - Best Diversity Paper Finalists
- M432 Action on Diversity - Best Paper on Humanitarian and Sustainability in a Global Engineering Context
- M512A Impacts of Sexual Harassment in Academic Science, Engineering, and Medicine
- M532 Why Can't We Get Faculty and Students to Go Abroad?
- M534 2018 Interdivisional Town Hall Meeting: Who's in the Driver's Seat of Engineering Education?
- T1111 Action on Diversity - Safe Zone Ally Training (Level 1)
- T132 Study and Research Abroad
- T332 International Engineering Education Poster Session
- T432 Globalizing Engineering Education? A Retrospective on the Newport Declaration
- T512A Action on Diversity - Safe Zone Ally Training (Level 2)

**Liberal Education/Engineering & Society Division**
- U434A Learning How to be Socially Responsible Engineers – A Comparison of Methods and Lessons Learned
- U434B Diversity and Inclusion: Concepts, Mental Models, and Interventions
- U434C Learning Outcomes and Pedagogical Strategies: Problems of Alignment
- U534A Communicating Across Cultural and Epistemological Boundaries
- U534B Design, Assessment, and Redesign of Writing Instruction for Engineers
- M341 Ethical Awareness and Social Responsibility in a Corporate/Team Context
- M344 Panel: Embedding Writing in Experiential Learning
- M512A Impacts of Sexual Harassment in Academic Science, Engineering, and Medicine
- M534 2018 Interdivisional Town Hall Meeting: Who's in the Driver's Seat of Engineering Education?
- T432 Globalizing Engineering Education? A Retrospective on the Newport Declaration
- T434 Imagining and Reimagining Engineering Education as a Dynamic System
- T534 Imagining Others, Defining Self Through Consideration of Ethical and Social Implications
- T634 LEES Business Meeting
- T734 LEES Reception and Dinner
- W1112A Revealing the Invisible: Engineering Course Activities that Address Privilege, -isms, and Power Relations (Interactive Session)
- W134 Seeking Resilience and Learning to Thrive Through Engineering Education
- W2112 DISTINGUISHED LECTURE: A Voice for Change - Building an Inclusive Future with Local Policy and Engineers
- W220 DISTINGUISHED LECTURE: It Takes More Than
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Schedule subject to change: Please go to www.asee.org/icp for up-to-date information
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YEARS AT THE HEART OF ENGINEERING EDUCATION

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U 2109C SUNDAY WORKSHOP: ELIPSS Project Workshop - Enhancing Learning by Assessing Professional Skills in Student Group Interactions and Written Work
U 2109D SUNDAY WORKSHOP: Hands-on workshop: Discovering opportunities to use a learning analytics solution for supporting quality assurance in your own institution
U 2109E SUNDAY WORKSHOP: Infusing Creativity and Conation into Engineering Education
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## Sponsoring Groups

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Upcoming ABET Sessions

**LISTENING SESSION: ACADEMIC ADVISORY COUNCIL**
Sun. June 24, 3:00 PM to 4:45 PM
150D, Salt Palace Convention Center

**ABET ACCREDITATION INFORMATION SESSION 2018**
Mon. June 25, 11:30 AM to 1:00 PM
150D, Salt Palace Convention Center

**HOW TO LEAD THE PREPARATION FOR AN ON-SITE VISIT**
Tues. June 26, 8:00 AM to 9:30 AM
150D, Salt Palace Convention Center

**BECOMING A PROGRAM EVALUATOR MIGHT BE FOR YOU!**
Tues. June 26, 1:30 PM to 3:00 PM
150D, Salt Palace Convention Center

**WHAT’S NEW AT ABET 2018?**
Tues. June 26, 3:15 PM to 4:45 PM
150D, Salt Palace Convention Center

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