JUNE 22 - 26, 2020

ASEE’S VIRTUAL CONFERENCE

At Home with Engineering Education

CONFFERENCE PROGRAM

PRESENTED BY UNIVERSITY OF MARYLAND
WPI, a purpose-driven community of educators and researchers, has been the global leader in project-based learning for 50 years.

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Welcome to ASEE’s 127th Annual Conference and Exposition—“At Home with Engineering Education.” It’s our first annual meeting conducted entirely online. Like many of you, I looked forward to a festive gathering in Montréal, but that will have to wait. Given the risk to the health of our members, the uncertainty of travel, and the likelihood that no city could host a crowd of thousands during a global pandemic, cancellation of the meeting became inevitable. The question then was, do we reschedule for later in the year or try something else?

ASEE’s Board of Directors gambled that an all-virtual conference, held at the same time in June, would work. Your response has been awesome, proving once again the resilient strength of our Society. I’m delighted to report that we have more than 3,000 attendees, over 1,700 peer-reviewed papers, hundreds of sessions, and more than 1,400 authors. While none of us pretends that computer screens capture the fun and conviviality of in-person connections, it’s amazing how close we’ve come to the real thing.

The workshops, distinguished lectures, panel discussions, and technical sessions in this program reflect an engineering education community buzzing with creative ideas. Some of the sessions are up to the minute, like Monday’s panel discussion among engineering and engineering technology deans on how their campuses have responded to COVID-19. Other sessions fuse cutting-edge technical research and pedagogy. One panel explores smart and renewable energy systems and accompanying teaching innovations. Another looks at new forms of micro-mobility and their impact on engineering education. You can also join several 30-minute virtual tours of energy facilities.

Times of economic uncertainty—like the present—prompt us all to think about our own and our colleagues’ careers and where they’re headed. To hear voices of wisdom and experience on this topic, tune in Tuesday for a session entitled “Busting a Career Move? When and Why or Why Not?” and another on Friday geared to junior and professional-track faculty.

As some of you know, a focus of my attention this year has been the well-being of our graduate students. So I’m personally gratified to see so many students registered and sessions offering insights on graduate education, such as a workshop on helping underrepresented minority doctoral candidates across the finish line.

Every conference involves hard work by many people and last-minute workarounds, but this one demanded an extra-large measure of ingenuity. It’s a true engineering feat. So I want to extend an especially warm thank you to sponsors and exhibitors, volunteer leaders, ASEE Executive Director Norman Fortenberry, and the headquarters staff who turned a risky idea into reality.

While we can’t share food and drink, you’ll notice many of our regular social events on the schedule. There’s one in particular I hope you’ll attend. At 5 p.m. ET on Friday, June 26, please fix a libation of your choice and join your friends and colleagues for the President’s Farewell Reception, where I will pass the gavelvirtually to President-Elect Sheryl Sorby.

Thank you for the honor of a lifetime: serving as your President. I have learned many things, made many new friends, and remain steadfast in my appreciation for—and commitment to—ASEE. Here’s to your continued good health and a successful conference!

Sincerely,

Stephanie Adams
ASEE President 2019-2020
# 2020 ASEE Virtual Conference and Exposition Program

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## Conference Sessions

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Schedule subject to change. Please go to [www.asee20.pathable.co](http://www.asee20.pathable.co) for up-to-date information.
ASEE’S VIRTUAL CONFERENCE
Board of Directors

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Department Head of Engineering Education, College of Engineering and Applied Science
University of Cincinnati

Chair, Engineering Technology Council
Scott Dunning
Professor and Director
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Vice President, External Relations
Agnieszka Miguel
Associate Professor and Chair, Electrical & Computer Engineering
Seattle University

Chair, Engineering Deans Council
Gilda Barabino
Dean and Berg Professor
Grove School of Engineering
City College of the City University New York

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Chair, Corporate Member Council
Dan Sayre
President
New World Associates

Chair, Council of Sections, Zone I
Pritpal Singh
Professor of Electrical and Computer Engineering
Villanova University

Chair, Professional Interest Council I
Christi Patton Luks
Professor of Chemical and Biochemical Engineering
Missouri University of Science and Technology

Chair, Council of Sections, Zone II
Andrew Kline
Associate Dean for Research and Graduate Education
College of Engineering and Applied Sciences
Western Michigan University

Chair, Professional Interest Council II
Peter Schmidt
Associate Professor of Mechanical Engineering
Mechanical and Civil Engineering Department
University of Evansville

Chair, Council of Sections, Zone III
Kenneth Van Treuren
Professor and Interim Department Head, Mechanical Engineering
Baylor University

Chair, Professional Interest Council IV
Beth Holloway
Assistant Dean for Diversity and Engagement; Leah H. Jamieson Director of Women in Engineering; and Assistant Professor, Mechanical Engineering (by courtesy), College of Engineering
Purdue University

Chair, Council of Sections, Zone IV
Lily Gossage
Director, Maximizing Engineering Potential, Center for Gender, Diversity & Student Excellence
College of Engineering
California State Polytechnic University, Pomona

Chair, Professional Interest Council V
Maureen Barcic
Director of Cooperative Engineering
Swanson School of Engineering
University of Pittsburgh

Executive Director
Norman L. Fortenberry
American Society for Engineering Education
ASEE would like to acknowledge and thank the 2020 ASEE Program and Division Chairs for their tireless efforts and dedication to our organization.

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<td>Afrin Naz</td>
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<td>Christopher J. Rowe</td>
<td>Vanderbilt University</td>
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<td>Robert A. Ross</td>
<td>University of Detroit Mercy</td>
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<td>Jason Forsyth</td>
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<td>Michelle Marincel Payne</td>
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<td>Stephanie Cutler</td>
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<td>Justin L. Hess</td>
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<td>Lessa Grunenfelder</td>
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### ASEE’S VIRTUAL CONFERENCE
### Conference-at-a-Glance

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<td>12:00 P.M. - 1:00 P.M.</td>
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<td>3:00 P.M. - 3:30 P.M.</td>
<td>After COVID-19: The Role of Engineering Schools in the Post-Pandemic Era</td>
<td>MEETING 1 LIVE INTERACTIVE - Business Meetings, Round Tables &amp; Special Sessions</td>
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<td>GREET THE STARS &amp; ASEE 101 Live Q&amp;A</td>
<td>MEETING 2 LIVE INTERACTIVE - Business Meetings, Round Tables &amp; Special Sessions</td>
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Schedule subject to change. Please go to [www.asee20.pathable.co](http://www.asee20.pathable.co) for up-to-date information.
ASEE’S VIRTUAL CONFERENCE
Conference-at-a-Glance

WEDNESDAY, JUNE 24

- SESSION 13 - Technical Session & Sponsor Tech & Live Q&A
- SESSION 14 - Technical Session & Sponsor Tech & Live Q&A
- SESSION 15 - Technical Session & Sponsor Tech & Live Q&A
- SESSION 16 - Technical Session & Sponsor Tech & Live Q&A
- SESSION 17 - Technical Session & Sponsor Tech & Live Q&A
- SESSION 18 - Technical Session & Sponsor Tech & Live Q&A

- Exclusive Live Interactive Exhibit Hall Time
- Live Panel Presentations

- Free Time
- Distinguished Lectures Live Q&A
- MEETING 3 LIVE INTERACTIVE - Business Meetings, Round Tables & Special Sessions
- MEETING 4 LIVE INTERACTIVE - Business Meetings, Round Tables & Special Sessions

- Workshops 4:30 pm - 6:00 pm

THURSDAY, JUNE 25

- SESSION 19 - Technical Session & Sponsor Tech & Live Q&A
- SESSION 20 - Technical Session & Sponsor Tech & Live Q&A
- SESSION 21 - Technical Session & Sponsor Tech & Live Q&A
- SESSION 22 - Technical Session & Sponsor Tech & Live Q&A
- SESSION 23 - Technical Session & Sponsor Tech & Live Q&A
- SESSION 24 - Technical Session & Sponsor Tech & Live Q&A

- Exclusive Live Interactive Exhibit Hall Time
- Live Panel Presentations

- Free Time
- MEETING 5 LIVE INTERACTIVE - Business Meetings, Round Tables & Special Sessions
- MEETING 6 LIVE INTERACTIVE - Business Meetings, Round Tables & Special Sessions
- MEETING 7 LIVE INTERACTIVE - Business Meetings, Round Tables & Special Sessions

- MEETING 8 LIVE INTERACTIVE - Business Meetings, Round Tables & Special Sessions

FRIDAY, JUNE 26

- SESSION 25 - Technical Session & Sponsor Tech & Live Q&A
- SESSION 26 - Technical Session & Sponsor Tech & Live Q&A
- SESSION 27 - Technical Session & Sponsor Tech & Live Q&A
- SESSION 28 - Technical Session & Sponsor Tech & Live Q&A
- SESSION 29 - Technical Session & Sponsor Tech & Live Q&A
- SESSION 30 - Technical Session & Sponsor Tech & Live Q&A

- Exclusive Live Interactive Exhibit Hall Time
- Live Panel Presentations

- Free Time
- MEETING 9 LIVE INTERACTIVE - Business Meetings, Round Tables & Special Sessions
- MEETING 10 LIVE INTERACTIVE - Business Meetings, Round Tables & Special Sessions
- MEETING 11 LIVE INTERACTIVE - Business Meetings, Round Tables, & Special Session

- MEETING 12 LIVE INTERACTIVE - Business Meetings, Round Tables, & Special Session
- PRESIDENT’S FAREWELL & Passing of the Gavel Interactive Social Event

Virtual Division Social Events & Fundraisers

Schedule subject to change. Please go to www.asee20.pathable.co for up-to-date information.
M258 Welcome Session
MONDAY, JUNE 22 9:30 TO 9:55 A.M.

JOIN PRESIDENT STEPHANIE ADAMS AND INNOVATIVE MUSICIAN KAI KIGHT AS WE KICK OFF ASEE’S FIRST-EVER VIRTUAL ANNUAL CONFERENCE!

Kai Kight
Violin Virtuoso

Entrepreneur Kai Kight, a former engineering student and a product of Stanford University’s innovation mecca, the d. School, combines classical violin music with personal stories and insights on engineering and ingenuity. He says, “I have a method for inspiration that will provoke thought in any audience. I have one rule: I never offer an idea unless I can first articulate my own failure. I consider my work a failure if people walk away thinking about me, so I use interactive exercises to ensure that attendees can apply the metaphors directly to their own path.”

FOCUS ON EXHIBITS: Virtual Showcases

M360· MONDAY, JUNE 22 NOON TO 1:00 P.M.
T360· TUESDAY, JUNE 23 NOON TO 1:00 P.M.
W360A· WEDNESDAY, JUNE 24 NOON TO 1:00 P.M.
R360· THURSDAY, JUNE 25 NOON TO 1:00 P.M.
F360· FRIDAY, JUNE 26 NOON TO 1:00 P.M.

The Exhibit Hall will be open daily from noon to 1 p.m. for live interactions with exhibitors and sponsors, and you have exclusive access! Whether it’s lab equipment, quality textbooks for your classes, innovative engineering initiatives, or cutting-edge software, you’ll likely find something interesting in ASEE’s virtual exhibit hall.

M458·Monday Keynote Live Question and Answer
Sponsored by the University of Maryland
MONDAY, JUNE 22, 2:00 TO 2:30 P.M.

Join friends and colleagues at our Monday Plenary, featuring a live question and answer session with TU Delft’s Aldert Kamp, moderated by ASEE President Stephanie Adams.

Aldert Kamp, director of education for TU Delft’s faculty of aerospace engineering, has been deeply involved in the rethinking of higher engineering education with a horizon of 2030. He has more than 20 years of industrial experience in space systems engineering and 15 years of academic teaching, educational management, and leadership. Author of the report “Engineering Education in a Rapidly Changing World - Rethinking the Vision for Higher Engineering Education,” and publisher of a blog entitled “Adapting Engineering Education to Change,” Kamp has extensive insight into the competencies engineering students will need at graduation for a successful career in the rapidly changing world of work. He has been involved in university-level education policy development, reconstruction of engineering curricula, and audits of Dutch and international engineering degree programs. He is the academic liaison for the Global E3 university consortium, European co-leader and council member of the CDIO Initiative (an innovative education framework for producing the next generation of engineers), and co-leader of the Dutch 4TU.Centre for Engineering Education, which facilitates innovations in higher engineering education.
M560B·COVID-19 Campus Response - Featuring Engineering and Engineering Technology Deans

Presented by the University of Maryland
MONDAY, JUNE 22 2:30 TO 3:30 P.M.
University of Maryland–College Park President Darryll Pines moderates a panel discussion with engineering and engineering technology deans on campus responses to the COVID-19 pandemic.

M560A·GREET THE STARS AND ASEE 101!

New Members Orientation and How to Get Involved with ASEE

MONDAY, JUNE 22, 3:30 TO 4:00 P.M.
Come learn what ASEE membership is all about, how to get involved in our unique organization, and tips for making the most of the Annual Conference experience at this orientation for new members and first-time conference attendees.

Moderated by ASEE Board member Gary D. Steffen

M658·ASEE Finance Town Hall and General Body Meeting

MONDAY, JUNE 22 4:00 TO 4:30 P.M.
Moderated by ASEE Board member Doug Tougaw P.E. and ASEE chief financial officer Joseph E. Dillon

U660·ASEE DIVISION MIXER Virtual Showcase

MONDAY, JUNE 22, 4:30 TO 5:30 P.M.
Join us for this perennially popular showcase of different divisions.

T458·TUESDAY Keynote Live Question and Answer

TUESDAY, JUNE 23, 2:00 TO 2:30 P.M.
Join friends and colleagues for a live question and answer session with Remi Duquette, vice president of innovation at MAYA Heat Transfer Technologies Ltd.

Moderated by ASEE President-Elect Sheryl Sorby
Remi Duquette heads the Datacenter Clarity LC global business and R&D directions at MAYA HTT, a heat-transfer technologies company. His current focus on artificial intelligence and deep neural networks brings clients’ digitalization investment to new heights and has proven to become business-critical to many existing clients. He was the driving force behind Maya’s DCIM solution Datacenter Clarity LC and also was instrumental in analyzing structural components of four successful spacecraft currently orbiting Earth. A former speed-skating champion in Quebec, Canada, Duquette attended the International Space University after completing his M.A.Sc. thesis on MOST, Canada’s first space telescope, at the University of Toronto Institute for Aerospace Studies. He is an engineering graduate from McGill University in Montréal.
In response to the COVID-19 outbreak, universities around the country moved to remote instruction for the remainder of spring term. Faculty and staff were directed to work remotely, and students were asked to move out of their residence halls—presumably to homes where they were expected to have Internet access and a place to study so that they could participate in virtual learning.

History has taught us that in the times of a national crisis, those from marginalized populations suffer the most. The gap between students who belong to disadvantaged groups and those who do not widens. Research has shown that the ability to identify with engineering and the feeling that they belong in their undergraduate peer group is key to students’ persistence, satisfaction, and self-efficacy. This is especially true for students from underrepresented groups. Furthermore, students from marginalized groups benefit from supportive learning communities more than others.

In this round table, we will discuss the impact of COVID-19 on engineering students, especially those who belong to underrepresented groups. How has the abrupt conversion to virtual learning affected students’ self-efficacy, motivation, persistence, and engineering identity? What are examples of successfully maintaining supportive learning communities during a pandemic? What are other best practices that lead to offering equitable and inclusive virtual education for all students in our community?

Moderated by ASEE Board member Agnieszka Miguel and ASEE Immediate Past President Stephanie Farrell.

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**W411B-DISTINGUISHED LECTURE:** Continued Conversation: Social Disruption of Emerging Technologies & Implications for Engineering Education

**WEDNESDAY, JUNE 24, 2:00 TO 2:30 P.M.**

Given the recent focus on emerging technologies, the anticipated shift in engineering education is toward a more socially relevant, outward-facing curricula. Such curricula emphasize multidisciplinary learning, societal impact, experiential learning (within and outside of the traditional classroom), and a global mindset. This distinguished lecture will introduce the global, legal, economic, environmental, and societal impacts of vehicle autonomy and electrification, and include an overview of some of the following impact areas: workforce disruption, driver safety, industry shifts, and educational training. Discussion will focus on the values of a liberal arts education in developing solutions for 21st-century emerging technologies, particularly the implications associated with vehicle autonomy and electrification in future mobility modes. Topics to be covered include the explosion in data-driven software development, innovation in vehicle design—such as composite bodies that are 3-D printed, and societal disruption involving vehicle operation, parking, auto industry employment, privacy, and business models.

Moderated by Dr. Brent Nowak and Mrs. Mary Andrade

**Speaker**

Kiran Bharwani

*Rivian*

Kiran Bharwani is a technical specialist in the domain of ADAS and autonomous driving. Starting his career with Caterpillar, he was tasked with leading the design and development of solutions to support ADAS and autonomous driving features on large mining trucks. He led a high-performing global team working on systems that include lidar, radar, cameras, GNSS, and V2X technologies. His journey from Caterpillar led him to the emerging industry of electric vehicles. He became the key member for developing the Level 4 self-parking feature on Faraday Future’s FF91, which was demonstrated live at CES 2017 in Las Vegas. Bharwani joined Rivian, an electric vehicle manufacturer, in 2017, eventually becoming vice president of autonomous driving. His team is developing technology for the electric adventure vehicles R1T and R1S.
The world is entering the “smart everything” age, and energy is no exception. Artificial intelligence (AI) is forming the new platform for tomorrow’s products, services, work environment, and the workforce. Data literacy is becoming an essential cross-cutting skill. Power grids are to be replaced by smart grids where electric generation plants, consumer devices, and storage systems are connected, and supply-and-demand analyses are made. To survive in this high-tech environment, society at large will have to embrace change and acquire new skills associated with Society 5.0. Future engineers will have to develop a creative mindset and focus on producing original ideas and inventing new goods and services.

Moderated by Dr. Lynn A. Albers and Dr. Maryam Younessi Sinaki

Dr. Yunus A. Çengel P.E.
University of Nevada, Reno

Dr. Yunus Çengel is a professor emeritus at the University of Nevada, Reno, and the founding dean of the Faculty of Engineering at Adnan Menderes University in Aydin, Turkey. He received his Ph.D. in mechanical engineering from North Carolina State University. Before joining ADU in 2012, he was the dean of the Faculty of Mechanical Engineering at Yildiz Technical University (YTU) and served as adviser to the president at the Scientific and Technological Research Council (TUBITAK) on international cooperation. He also served as adviser to several government organizations and private companies on energy efficiency, energy policies, and education reform. Çengel, a registered professional engineer in Nevada, is the author or coauthor of several widely adopted textbooks published by McGraw-Hill, including Thermodynamics: An Engineering Approach and Differential Equations for Scientists and Engineers. He has given numerous seminars and written articles and prepared reports on a variety of topics. The recipient of several outstanding teaching awards, he has twice received the ASEE Meriam/Wiley Distinguished Author Award.

Active learning classrooms are now a common feature at many higher education institutions. They are also rapidly blending the physical and virtual worlds to create new types of hybrid learning experiences. While these continue to be created, it is not always the case that faculty are engaged in the design process. However, faculty participation can make a significant difference in the design of learning spaces, and participation by faculty and students in the process is a way to promote the uptake of active pedagogy. Classroom space, which was largely static and relatively unstudied, is undergoing a renaissance both in terms of creative design and scholarly investigation. In her presentation, Prof. Susan McCahan will discuss the history of formal university classrooms and how we arrived at active-learning space design. She will describe an example of participatory design and the outcomes from that process.

Moderated by Nathan Kahl

Dr. Susan McCahan
University of Toronto

Susan McCahan is the Vice Provost, Innovations in Undergraduate Education and Vice Provost, Academic Programs at the University of Toronto. She is responsible for developing and implementing initiatives to re-imagine and strengthen academic experiences at the university. This includes strategic leadership on IT systems and data systems that support academic processes and teaching, and leadership on key pedagogical initiatives such as experiential learning. Her Academic Programs portfolio oversees governance and quality assurance of the university’s 700 graduate and undergraduate programs.

Previously, she was the Vice Dean, Undergraduate in the Faculty of Applied Science and Engineering. She is a professor of mechanical engineering who specialized in thermodynamics. However, her current area of research is engineering education. She is the author of a textbook for first year engineering design, which she continues to teach. A fellow of the American Association for Advancement in Science, she is the past president of the Canadian Engineering Education Association. She has received numerous awards for education excellence and leadership, including the 3M National Teaching Fellowship.
Papers Presented

Authors: Georgios Georgalis and Karen Marais, Purdue University at West Lafayette

Authors: Alexander John De Rosa and Maxine Fontaine, Stevens Institute of Technology

Authors: La’Tonia Stiner-Jones and Wolfgang Windl, Ohio State State University

Authors: Lindy Hamilton Mayled, Arizona State University; Lydia Ross, Arizona State University; Casey Jane Ankeny, Northwestern University; and Jay Oswald, Arizona State University

Authors: Eric Davishahl, Whatcom Community College; Todd Haskell, Western Washington University; Jill Davishahl, Western Washington University; Lee Singleton, Whatcom Community College; and Wade H. Goodridge, Utah State University

6. Best 2019 PIC IV Paper: “Students’ Views on their Role in Society as an Engineer and Relevant Ethical Issues”
Authors: Angela R. Bielefeldt, University of Colorado Boulder; David Zhao; Alexandra Kulich; Madeline Polmear, University of Florida; Nathan E. Canney; Chris Swan, Tufts University; and Daniel Knight, University of Colorado Boulder

Author: Katherine McConnell, University of Colorado Boulder

8. Best 2019 Zone II Paper: “Research to Practice: Leveraging Concept Inventories in Statics Instruction”
Authors: Ruth Wertz P.E., Valparaiso University; and Theresa Green, Utah State University

Authors: Amardeep Kaur and Theresa Mae Swift, Missouri University of Science and Technology

Author: Bryan Mealy, California Polytechnic State University, San Luis Obispo

W458A·DISTINGUISHED LECTURE: 2019 Best PIC, Zone, and Diversity Papers Live Q&A
WEDNESDAY, JUNE 24, 2:00 TO 2:30 P.M.
Featuring the Best PIC, Zone, and Diversity Paper Award winners from the 2019 Annual Conference.
Moderated by ASEE Board member Peter L. Schmidt P.E.

W477B·DISTINGUISHED LECTURE: Indigeneering Engineering Education: Welcoming Indigenous Knowledge and Wisdom with Integrity
WEDNESDAY, JUNE 24 2:00 TO 2:30 P.M.

A transforming world invites us to change our mindset and consider more innovation, collaboration, and responses to global challenges. Deanna Burgart, Indigeneer, believes that greater incorporation of diverse perspectives, including Indigenous perspectives and worldviews, can be a catalyst to finding solutions in a more meaningful, long-term way. In this distinguished lecture, Burgart will introduce participants to Indigenous ways of knowing, being, and doing. She will share her own stories and examples of initiatives of Indigenous inclusion as well as the results of a two-day retreat held for Indigenous and non-Indigenous STEM professionals, educators, and community members exploring the best ways to inspire Indigenous youth to pursue STEM careers. She also will summarize a literature review, examine incidents of cultural appropriation, and discuss how to protect Indigenous knowledge going forward while bringing Indigenous perspectives to the engineering education landscape in an ethical space of cultural safety that protects the integrity of Indigenous beliefs and worldviews. Participants will leave feeling empowered to listen, learn, and grow with the wisdom of Indigenous peoples they are fortunate to meet on their journey.

Moderated by Dr. Susan E. Walden, 2019–20 chair of ASEE’s Commission on Diversity, Equity & Inclusion

Speaker
Deanna Burgart
Schulich School of Engineering, University of Calgary

Deanna Burgart, P.Eng, CET, is both an engineer and a technologist who began her career in 1998 as a technician analyzing oil sands in a Calgary laboratory. She brings over 20 years of experience and education in energy and pipelines, and is passionate about global energy transitions, the United Nations Sustainable Development Goals, and the United Nations Declaration on the Rights of Indigenous Peoples. She helps STEM-focused organizations move forward in increasing inclusion of Indigenous people, knowledge, and perspectives. She recently joined the University of Calgary’s Schulich School of Engineering as a senior instructor in chemical and petroleum engineering and is the first teaching chair focused on integrating Indigenous knowledge into engineering.
W414·DISTINGUISHED LECTURE: Talking the Talk and Walking the Walk: How Our Publications Reflect the Engineering Education Community

WEDNESDAY, JUNE 24, 2:00 TO 2:30 P.M.

As members of a community of scholars, what we write about and who we write about are artifacts of our culture; they reflect who we are collectively. The engineering education community is unique: As students, educators, and researchers, we hail from different disciplinary backgrounds and bring different expectations about sharing ideas, data, and authorship, and about the standards we set for our scholarship. As our community develops and grows, many of us are wary of bringing along excess baggage from our home disciplines that make it difficult for students, early career faculty, and those from marginalized populations in engineering to survive and thrive. In fact, for many of us, negative experiences in our home disciplines (being overlooked for recognition or promotion, being harassed or patronized, being undervalued) served as the impetus for finding our way into engineering education.

In this distinguished lecture, Journal of Engineering Education editor Lisa Benson will identify parallels between scholarship in engineering education and approaches to transformational change in engineering education. She also will highlight the issue of access to engineering education scholarship and the ways our community reflects its values and beliefs through its scholarly work as well as its actions related to sharing and building on that work.

Moderated by Dr. James J. Pembridge and Dr. Sarah E. Zappe

Speaker
Dr. Lisa Benson
Clemson University

Lisa Benson is a professor of engineering and science education at Clemson University and the editor-in-chief of the Journal of Engineering Education. Her research focuses on the interactions between student motivation and their learning experiences. Her projects include studies of student perceptions, beliefs, and attitudes toward becoming engineers and scientists, and their development of problem-solving skills, self-regulated learning practices, and epistemic beliefs. She is an ASEE Fellow and a member of the European Society for Engineering Education (SEFI), the American Educational Research Association (AERA) and Tau Beta Pi, and the 2018 recipient of the Clemson University Class of ’39 Award for Faculty Excellence. She earned a B.S. in bioengineering (1978) from the University of Vermont, and M.S. (1986) and Ph.D. (2002) degrees in bioengineering from Clemson University.

W560B·Live Interactive ASEE Fellows Session - for Fellows Only

WEDNESDAY, JUNE 24, 2:30 TO 3:30 P.M.

For new and existing ASEE Fellows

Moderated by Dr. Sarah A. Rajala

W560A·DIVERSITY ROUND TABLE: COVID-19 Impact on Faculty Academic Careers

WEDNESDAY, JUNE 24, 2:30 TO 3:30 P.M.

COVID-19 has upended all aspects of traditional university life. Faculty are experiencing additional demands necessitated by the move to online platforms for all teaching and administrative work as well as strains placed on research agendas due to laboratories closing, limited fieldwork, and curtailed in-person contact. Off-campus life has also been upended. Faculty who are parents of school-age children are struggling to balance teaching virtually while also caring for their families. Those with elderly parents face extremely difficult decisions about social distancing and best care practices. Single faculty are isolated at home, separated from their friends and families.

Given extensive evidence indicating that women disproportionately shoulder more caregiving at home, what are the implications now that female faculty find themselves balancing workloads that have grown heavier with the challenges associated with the abrupt move to remote instruction and working from home?

Scholars of women in the workplace note that many of the activities that are integral to the reputation and everyday functioning of an organization are often performed by women and, accordingly, are taken for granted as a “natural” expression of women’s preferences for this sort of work. Female faculty disproportionately perform “hidden work” within universities, and this essential work is not compensated within current faculty reward structures around promotion. How can we think strategically and systematically about the implications of the profound shifts in faculty work caused by COVID-19 for the long term, and how will it differentially impact diverse faculty in terms of workload, tenure and promotion, salaries, and teaching evaluations?

Moderated by ASEE Board member Agnieszka Miguel

W758·PRESIDENT’S FAREWELL RECEPTION and Passing of the Gavel

FRIDAY, JUNE 26, 5:00 TO 6:00 P.M.

Join us as we say goodbye to ASEE President Stephanie Adams and welcome President-Elect Sheryl Sorby.
Safe Zone Ally Training Workshops

Safe Zone Ally Training workshops are interactive, research-informed workshops that seek to foster a more inclusive environment for LGBTQ+ individuals in STEM through building participant knowledge and skills and creating a visible network of allies. Faculty, students, administrators, staff, and other professionals are encouraged to participate in these workshops.

The Level 1 Safe Zone workshop explores key LGBTQ+ terms and concepts, LGBTQ+ identity development and the coming out process, and simple ally strategies to help build an inclusive environment for LGBTQ+ individuals in STEM.

The Level 2 Safe Zone workshop explores the concepts and implications of privilege and bias, the climate for LGBTQ+ individuals in STEM and ways that allies can support LGBTQ+ students and colleagues, and techniques for creating inclusive classroom environments.

The Trans Allyship workshop explores transgender-specific terms and concepts, the climate for trans individuals in society and in STEM and its broader implications, and action strategies for trans allies.

ASEE Safe Zone Ally Training workshops are supported by the National Science Foundation through grants EEC-1539140 and EEC-1748499. To learn more and access free ally resources, please visit https://lgbtq.asee.org/.

R577• Safe Zone Ally Training Workshop: Trans Allyship

THURSDAY, JUNE 25 3:00 TO 4:00 P.M.

Speakers

Dr. Alisha L. Sarang-Sieminski, Franklin W. Olin College of Engineering

Dr. Brian P. Kirkmeyer, Miami University

T577B• Safe Zone Ally Training Workshop: Level 1

TUESDAY, JUNE 23 3:30 TO 4:30 P.M.

Speakers

Dr. Adrienne Minerick, Michigan Technological University

Dr. Kelly J. Cross, University of Nevada, Reno

W577B• Safe Zone Ally Training Workshop: Level 2

WEDNESDAY, JUNE 24 3:30 P.M. TO 4:30 P.M.

Speakers

Prof. Alon V. McCormick, University of Minnesota–Twin Cities

Mr. Tiago R. Forin, Rowan University
M479·ABET Conducts Remote Program Accreditation Reviews in 2020 - 2021
MONDAY, JUNE 22 1:00 TO 1:30 P.M.

Repeated on Friday, June 26
This session will summarize how best to address ABET accreditation within the context of academic program response to the novel coronavirus pandemic.
ABET’s Chief Accreditation Officer, Dr. Joe Sussman, and Senior Director of Accreditation Operations, Jane Emmet, will discuss modifications to ABET operations and how these modifications will affect program reviews, acknowledging the current delivery changes to academic programs that have affected teaching and learning.
They also will answer questions regarding how best to prepare for ABET accreditation given the current status of academic program offerings at institutions around the globe.
We especially encourage participation from programs with ABET visits planned for Fall 2020. Please bring your ABET leaders to this session.

Speakers
Dr. Joseph L. Sussman, Chief Accreditation Officer, Chief Information Officer, ABET
Ms. Jane Emmet, Senior Director, Accreditation, ABET

W479·ABET Criteria and Opportunities for Inclusion in Engineering Education
WEDNESDAY, JUNE 24 1:00 TO 1:30 P.M.

Beginning in Fall 2019, programs undergoing review by the Engineering Accreditation Commission (EAC) of ABET are being evaluated based on recently revised criteria. ABET is never prescriptive about how programs choose to meet the requirements; its review process is designed to assure programs meet quality standards set forth in the EAC criteria and the Accreditation Policy and Procedure Manual, known as the APPM. The changes to EAC General Criteria create a number of opportunities to modify our traditional approaches to educating future engineers so they are not only aware of the need to practice engineering in an inclusive manner but are also equipped to do so.
This session will highlight ABET EAC criteria changes that promote diversity, equity, and inclusion, along with strategies for addressing them in ways that support the attainment of EAC Criterion 3 Student Outcomes. Connections will be made to various engineering codes of ethics (e.g., NSPE, ASCE, IEEE, AIChE) as appropriate.

Speaker
Dr. Yvette E. Pearson, P.E., Rice University

R479·Making an Impact on STEM Education - Become an ABET Program Evaluator!
THURSDAY, JUNE 25 1:00 TO 1:30 P.M.

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 and confidence in technical education worldwide. These volunteer experts play a key role in ensuring that today’s college students are prepared to develop solutions that address some of the pressing sustainability challenges facing our planet. This session will provide important and timely information for prospective ABET Program Evaluators, including:

I. the impact of an ABET program evaluator on STEM education
II. an overview of ABET’s international growth and increasing need for program evaluators
III. the scope of program evaluator responsibilities
IV. requirements for service as an ABET program evaluator and an overview of the selection process
V. the program evaluator training process

Speaker
Dr. Jennifer McFerran Brock, University of Alaska Anchorage

F479·ABET Conducts Remote Program Accreditation Reviews in 2020 - 2021
FRIDAY, JUNE 26 1:00 TO 1:30 P.M.

ABET’s chief accreditation officer and senior director of accreditation operations will summarize recent modifications to ABET operations and discuss how best to address ABET accreditation within the context of academic program response to the COVID-19 pandemic and changes in delivery that affect teaching and learning.

Speakers
Dr. Joseph L. Sussman, Chief Accreditation Officer, Chief Information Officer, ABET
Ms. Jane Emmet, Senior Director, Accreditation, ABET

Schedule subject to change. Please go to www.asee20.pathable.co for up-to-date information.
Corporate Member Council and College-Industry Partnerships Division INDUSTRY DAY

**W766·INDUSTRY DAY: CMC and CIPD Virtual Kick-off**
**WED. JUNE 24 7:00 TO 9:00 P.M.**

The Corporate Member Council (CMC) and College-Industry Partnerships Division (CIPD) invites members and those interested in becoming members to attend the CMC and CIPD joint virtual social to kick off Industry Day.

**R466A·INDUSTRY DAY: Hearing from Diverse Voices from the Classroom**
**THURSDAY. JUNE 25 1:00 TO 1:30 P.M.**

Hear from a diverse group of recent graduates to learn why they decided to change the world as engineering students. What does it mean to these new engineers to see diversity in the classroom and how can it help drive innovation in the workplace? Learn what educators, academic institutions, and industry need to do to nurture creativity in high school and maintain excitement throughout the college experience. Be a part of the discussion on increasing different perspectives in the global family of engineers and innovators.

*Moderated by Mrs. Cynthia Murphy-Ortega*

**R466B·Corporate Member Council - Board Meeting**
**THURSDAY, JUNE 25 2:00 TO 3:00 P.M.**

All attendees from CMC member companies are welcome and encouraged to attend the annual board meeting. We will be electing our new board members, reporting on the past year’s accomplishments, and planning our future activities.

**F466·INDUSTRY DAY: Preparing Students for Transformative Technology**
**FRIDAY, JUNE 26 1:00 P.M. TO 1:30 P.M.**

Megatrends like artificial intelligence, the Internet of Things, and 5G will change profoundly the way future engineers apply theory to applications like Industry 4.0, autonomous vehicles, and health care. How will educators adapt engineering curricula to prepare students for areas that were science fiction just a decade ago? Join a panel of educators, policymakers, and industrial leaders to learn how they recommend enhancing engineering curricula to address the needs of future innovators.

*Moderated by Dr. David Pistrui and P.J. Boardman*
**M399· Using zyBooks to Teach in a COVID-19 and Post-COVID-19 Environment**  
*Presented by zyBooks*  
**MONDAY JUNE 22 11:00 TO 11:20 A.M.*

As higher education institutions grapple with the uncertainty of students returning to campus this fall, many instructors are preparing for courses that can seamlessly transition between in-person and online instruction. This talk presents an overview of zyBooks, which are interactive online engineering textbooks proven to increase student confidence in engineering courses. We will explore methods to incentivize student reading, assign auto-graded homework and coding labs, and track student learning for engineering courses.

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**T399F· Assessments in the Online Engineering Classroom**  
*Presented by Wiley*  
**TUESDAY, JUNE 23 10:40 TO 11:00 A.M.*

Pivoting to online teaching can prove challenging, especially in problem-based engineering courses. Administering engineering homework, projects, and exams in a virtual environment requires a thoughtful approach. Two experienced educators will share their strategies and tips for managing assessment online based on decades of collective experience.

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**T299A· Enabling Virtual Classrooms Without Giving Up Hands-on Labs (Or, Save the Disinfectant for the Bathroom, not the Lab)**  
*Presented by Analog Devices*  
**TUESDAY, JUNE 23 10:00 TO 10:20 A.M.*

Colleges and universities are suddenly faced with the challenge of adapting nearly all classroom instruction to a virtual setting. Lectures are difficult enough to run online; hands-on lab exercises are orders of magnitude more so. The Analog Devices University Program is an open-source educational platform consisting of freely available laboratory exercises and accompanying low-cost parts kits and test instruments that can be leveraged as hands-on learning at students’ homes. In this session, we will demonstrate how to use free software, low-cost test instruments, and common materials in a variety of experiments spanning multiple disciplines and share some tricks that Analog Devices engineers have developed.

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**T299B· The Expedited Evolution of Engineering Education: What’s Next?**  
*Presented by McGraw Hill*  
**TUESDAY, JUNE 23 10:20 TO 10:40 A.M.*

Engineering students, faculty, and McGraw Hill’s President and CEO discuss how the migration to remote learning has prompted an expedited evolution to their approach. They’ll take on subjects like moving from theoretical knowledge to applied knowledge, and why an online course component is built a certain way.

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**T399B· Sponsor Technical Session**  
*Presented by Liaison*  
**TUESDAY, JUNE 23 11:00 TO 11:20 A.M.*

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**T399D· Get Your Simple-to-Use TI-RSLK MAX Robot Fully Built, Tested, and Ready for Learning in Under 20 Minutes**  
*Presented by Texas Instruments*  
**TUESDAY, JUNE 23 11:20 TO 11:40 A.M.*

The newest addition to the TI-RSLK product family, the TI-RSLK MAX is user-friendly, can be assembled quickly, and provides hands-on options for teaching embedded systems design. With a solderless building process and updated curriculum to tackle many fundamental and trending topics in engineering, the kit can easily be implemented in large or small classes and is ideal for classes with time constraints, flipped classrooms, virtual distance learning, or limited lab technology. This session will show you how to construct the robotics kit and test the functionality with our TI-RSLK MAX debug application.

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**T399E· Online Learning with MATLAB and Simulink**  
*Presented by MathWorks*  
**TUESDAY, JUNE 23 11:40 A.M. TO NOON**

Educators are having to adapt their courses to achieve their learning objectives while faced with changing student and university requirements. As part of the transition, educators need to provide hands-on experience through lab-based modules. MathWorks provides several cloud-based tools to enable the creation of flexible teaching and learning plans. In this session, we’ll discuss how these tools can contribute to course development and delivery workflow with potential for immediate use in classes and labs.
T499A· Challenges and Potential Solutions for Engineering Education Posed by the COVID-19 Pandemic

Presented by the University of Maryland
TUESDAY, JUNE 23 1:00 TO 2:00 P.M.

We invite a community discussion, moderated by a panel of leading thinkers, on responding to educational challenges created by the COVID-19 pandemic to continue delivering high-quality educational offerings that meet both course and program outcomes. Topics include providing virtual hands-on experiences such as cornerstone and capstone design team projects; assessment and exam administration; student supports and extracurricular activities; assessment strategies; course design; and technology needs.

Speakers:
Dr. Kerrie A. Douglas, Assistant Professor of Engineering Education, Purdue University
Dr. Laurence J. Jacobs, Professor and Associate Dean for Academic Affairs, College of Engineering, Georgia Institute of Technology
Dr. Joanna Mirecki Millunchick, Arthur F. Thurnau Professor and Associate Dean for Undergraduate Education, College of Engineering, University of Michigan
Dr. Sheri Sheppard, Professor of Mechanical Engineering, Stanford University
Dr. Kenneth T. Kiger, Keystone Professor and Associate Dean for Undergraduate Education, A. James Clark School of Engineering, University of Maryland

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W299A· Integrating Coordinate Metrology into Engineering Programs

Presented by ZEISS Industrial Quality Solutions
WEDNESDAY, JUNE 24 10:00 TO 10:20 A.M.

Join the ZEISS academic program team in a discussion of how using coordinate measuring machines in educational institutions can help engineering students understand the importance of quality control in manufacturing. Presentation includes an overview of the need for metrology education for an advanced manufacturing workforce, a demonstration of ZEISS CMM equipment and software, and an overview of the special packages ZEISS offers to educational institutions.

Speaker
Ms. Lauren Van Beek, Academic Program Manager, ZEISS Industrial Quality Solutions

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W299B· Sponsor Technical Session

Presented by MSC Software
WEDNESDAY, JUNE 24 10:20 A.M. TO 10:40 A.M.

W399B· Innovation in Engineering Education – Fusing Electromagnetic Simulations with Theory and Experiments in Antenna and Wireless Communication Courses

Presented by Altair
WEDNESDAY, JUNE 24 10:40 TO 11:00 A.M.

With the advent of advanced engineering simulation technology and the availability of powerful, inexpensive computers, engineering education now can include complex real-life problems that enhance students’ analytical skills. During this session, we will present Altair’s advanced electromagnetic simulation tools for antenna design wireless communication courses. We will also present case studies of how electromagnetic simulations are successfully fused with theory and experiments by educators at different universities.

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W399C· Hands-on, Project-based Learning with Digital Twins for Mechatronics in Engineering Education and Research

Presented by Altair
WEDNESDAY, JUNE 24 11:00 A.M. TO 11:20 A.M.

In this age of the Internet of Things, Big Data, analytics and mechatronics, it is the multidisciplinary intersections of mechanical, electrical, and control systems that provide the product and experience opportunities the marketplace is seeking for applications ranging from autonomous vehicles to wearable devices. In this technical session, we will demonstrate a comprehensive Mechatronics educational kit to teach and learn model-based development with the highest fidelity digital twin.
W399A· How to Implement Online Hands-on Classes During the Time of COVID-19
Presented by STMicroelectronics
WEDNESDAY, JUNE 24 11:20 TO 11:40 A.M.

The current pandemic is putting our education system under strain, and this creates a greater need to accelerate the implementation of online teaching to ensure the continuity of programs and student engagement. This session will explore different approaches of hands-on, online curricula for IoT, embedded machine learning, low-level firmware programming, and motor control developed by professors William Kaiser (University of California, Los Angeles) and Yifeng Zhu (University of Maine). This content is available on www.st.com/educationalplatforms.

W399D· Prepare Students with Industry-Ready RF/Microwave Skills
Presented by Keysight Technologies
WEDNESDAY, JUNE 24 11:40 A.M. TO NOON

Owing to 5G, wireless communications have evolved rapidly in the past decade and play a significant role in the automotive, Industry 4.0, and IoT ecosystems. Industries demand that future engineers are well-equipped with RF knowledge and skills to hit the ground running from Day One. In this session, you will better understand the skills your students need to be equipped with to effectively design, test, and deploy an RF product in the real world.

R399B· Sponsor Technical Session
Presented by IEEE
THURSDAY, JUNE 25 11:20 TO 11:40 A.M.

R399A· Sponsor Technical Session
Presented by STMicroelectronics
THURSDAY, JUNE 25 11:40 A.M. TO NOON

F399A· Sponsor Technical Session
Presented by Gradescope by Turnitin
FRIDAY, JUNE 26 11:00 TO 11:20 A.M.

Schedule subject to change. Please go to www.asee20.pathable.co 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
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Host

University of Maryland
A. James Clark School of Engineering
ASEE would like to thank the following sponsors for their generous support of the 2020 ASEE Annual Conference. Thank you for your commitment to furthering excellence in engineering and engineering technology education.
### Exhibitors

| ASEE Commission on Diversity, Equity, and Inclusion | MathWorks |
| ASEE Commission on P-12 Engineering Education | McGraw-Hill Higher Education |
| DENSO Robotics | National Science Foundation |
| EngineeringUnleashed | National Science Foundation ATE Centers |
| Gradescope by Turnitin | Rubin |
| ICE Publishing | SAE International |
| IEEE Xplore Digital Library | Siemens Digital Industry Software Inc. |
| Journal of Engineering Education | Tufts University |
| Keysight | University of Cincinnati |
| Latin American and Caribbean Consortium of Engineering Institutions | University of Maryland College Park |
| Wiley | Zybooks |
**Fees**
The registration fee will be discounted 30 percent from the original rates. Those who have already registered, paid, and plan to attend the online experience will receive a 30 percent refund. Registered attendees will be sent a separate email outlining their options.

**Registration Fees**

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**Included in your registration:**

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**K-12 Teachers**
K-12 teachers’ rate of $175 applies to the entire conference. School ID is required.

**AAE Membership**
Please be advised that the non-member professional rate does not include ASEE membership. Follow this link [https://www.asee.org/about-us/types-of-membership](https://www.asee.org/about-us/types-of-membership)

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2. US $99 for Canadian residents
3. US $114 for residents of all other countries
4. $89 for online membership only

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Registrants with special needs who participate in our conference will be accommodated to the fullest extent possible. If you need special arrangements, please advise us at the time you register or email us at conferences@asee.org.
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2021
June 27 – 30
LONG BEACH, CALIFORNIA

2022
June 26 – 29
MINNEAPOLIS, MINNESOTA

2023
June 25 – 28
BALTIMORE, MARYLAND

2024
June 19 – 22
PORTLAND, OREGON

Schedule subject to change. Please go to www.asee20.pathable.co for up-to-date information.
M201 - Aerospace Design and Manufacturing (Student Papers)
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Aerospace Division
Moderators: Sharan Asundi, Old Dominion University; Nadir Yilmaz, Howard University

Educational Benefits of Unmanned Aerial System Design and Interdisciplinary Engineering Opportunities
Logan Walker Graves, Los Alamos National Labs
Dr. Michael C. Hatfield, University of Alaska, Fairbanks

Undergraduate Demonstration of a Hall Effect Thruster: Self-Directed Learning in an Advanced Project Context
Braden K. Oh, Olin College of Engineering
Justin Harauki Kunimune, Olin College of Engineering
Jonah Spicher, Olin College of Engineering
Lauren Anfenson, Olin College of Engineering
Dr. Rebecca Christianson, Draper Labs

Art in Space: Using Art to Interest K-12 Students in Aerospace Design
Maria Baklund, University of St. Thomas
Miss MiKyla Jean Harjamaki, Playful Learning Lab
Hannah French
Patrick Roche, University of St. Thomas
Mr. Collin John Goldbach, Playful Learning Lab
Cullen Charles Kittams, University of St. Thomas
Molly Roche, University of St. Thomas
Dr. Deborah Besser P.E., University of St. Thomas
Mr. Damian Kulash Jr., OK Go
Dr. Jeff Jalkio, University of St. Thomas
Dr. AnnMarie Thomas, University of St. Thomas

An Engineering Pedagogy for Developing Practical Knowledge and Hands-on Skills Related to 5-axis Milling and Computer-aided Aerospace Parts Manufacturing Using Current Technology
Mr. John Vincent Kronenberger, Oregon Institute of Technology
Dr. David E. Culler, Oregon Institute of Technology
Alexander Max Ferere, Oregon Institute of Technology

M202 - Architectural Engineering Division Technical Session 1
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE

Sponsors: Architectural Engineering Division; Construction Engineering Division

Moderator: Christina McCoy, Oklahoma State University

Bringing Building Information Modeling (BIM) into the Process for Building Structure Design Courses
Prof. John J. Phillips, Oklahoma State University
Jenna A. Harbert

A Hybrid Online/Lectures Teaching Model for Mechanics of Structures Courses Involving New Learning Spaces
Prof. Miguel X. Rodriguez-Paz, Tecnológico de Monterrey
Mr. Jorge A. Gonzalez, Tecnológico de Monterrey
Prof. Israel Zamora-Hernandez, Tecnológico de Monterrey
Dr. Gibrán Sayeg-Sánchez, Tecnológico de Monterrey
Prof. Martha Elena Nuñez, Tecnológico de Monterrey

Smart Environments for Assisted Living: A Multidisciplinary Collaboration in Engineering and Architecture Education
Ms. Adriana Rios Santiago, Texas Southmost College
Dr. Anabel Pineda-Briseño, Tecnologico Nacional de Mexico/Instituto Tecnologico de Matamoros
Dr. Jesus A. Gonzalez-Rodriguez, University of Texas Rio Grande Valley
Ing. Uriel Saul Huerta P.E., Tecnologico de Leon

Art, Architecture, and Community: Create Spaces to Highlight Local Talent
Prof. Darrell D. Nickolson, Indiana University Purdue University, Indianapolis
Katie Pruitt

M204 - Educational Interventions and Pedagogy in Biomedical Engineering - June 22nd
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Biomedical Engineering Division
Moderators: Joe Tranquillo, Bucknell University; Casey Ankeny, Northwestern University

Peer Instruction Can be as Effective as Lecture-based Instruction in Biomedical Engineering
Dr. Eileen Haase, Johns Hopkins University
Dr. Harry R. Goldberg, Johns Hopkins University

Student Collaboration as a Strategy to Achieve Learning Outcomes in Biomaterials Courses
ASEE’S VIRTUAL CONFERENCE
MONDAY, JUNE 22 SESSIONS

M205 - Chemical Engineering in K-12 and the First Year
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Chemical Engineering Division
Moderators: Margot A Vigeant, Bucknell University; Katelyn Dahlke, University of Wisconsin - Madison
Clean Water through Chemical Engineering: Introducing K-12 Students to ChE Using Filtration
Dr. Ashlee N. Ford Versypt, Oklahoma State University
Dr. Daria Khvostichenko, University of Illinois at Urbana-Champaign
First Impressions: Engaging First-Year Undergraduates in Chemical Engineering Design
Tommy George, Harvard University
Alexander Seth Klein
Dr. Kristen B. Wendell, Tufts University
The Design and Impact of a Combined Makerspace, Wet Lab, and Instructional Design Studio for Chemical Engineering Curriculum
Prof. Anthony Butterfield, University of Utah
How We Teach: Chemical Engineering in the First Year
Dr. Laura P Ford, The University of Tulsa
Dr. Janie Brennan, Washington University in St. Louis
Dr. Jennifer Cole, Northwestern University
Dr. Kevin D. Dahm, Rowan University
Prof. Marnie V. Jamieson, University of Alberta
Dr. Lucas James Landherr, Northeastern University
Dr. David L. Silverstein P.E., University of Kentucky
Dr. Margot A Vigeant, Bucknell University
Dr. Christy Wheeler West, University of South Alabama
Dr. Stephen Ward Thiel P.E., University of Cincinnati
CACHE/ASEE Survey on Computing in Chemical Engineering
Dr. Robert P. Hesketh, Rowan University
Dr. Margot A Vigeant, Bucknell University
Prof. Martha Grover, Georgia Institute of Technology
Dr. David L. Silverstein P.E., University of Kentucky

M206A - Inquiry, Inclusivity, and Integration
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Civil Engineering Division
Moderator: Brock Barry, United States Military Academy
This session includes papers on inquiry-based learning, integrated teaching of design, and use of a variety of pedagogical techniques in civil engineering courses.
An Integrated Teaching Method for Design Courses
Dr. Scott A Civjan, University of Massachusetts, Amherst
Student Support, Confidence, Workload, and Video Resources in a New Civil Engineering Graphics Course
Mr. Bradley James Schmid, University of Saskatchewan
Work in Progress: Inquiry-Based Learning in Transportation Engineering
Dr. Ilgin Guler, Pennsylvania State University
Dr. Stephanie Cutler, Pennsylvania State University, University Park
Dr. Sarah E. Zappe, Pennsylvania State University
Inclusive Learning Approach to Teach Concepts of Pavement Management Systems to Seniors and Graduate Students in Civil Engineering
Mr. Harshdutta I Pandya, Rowan University
Dr. Yusuf Mehta P.E., Rowan University
Mr. Andrae Francois, Rowan University Center for Research and Education in Advanced Transportation Systems (CREATEs)
Dr. Dan Offenbacker, Rowan University, Center for Research and Education in Advanced Transportation Engineering Systems (CREATEs)
M206B - Perceptions, Projects, and Practical Approaches
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Civil Engineering Division
Moderator: Jakob Bruhl, United States Military Academy

This session includes papers on pedagogical practices related to design, project-based learning, and teaching theory in a practical way.

Examining Undergraduate Engineering Students’ Perceptions of Solving an Ill-Structured Problem in Civil Engineering
Secil Akinci-Ceylan, Iowa State University
Dr. Kristen Sara Cetin, Michigan State University
Dr. Benjamin Ahn, Iowa State University of Science and Technology
Dr. Bora Cetin, Michigan State University

Practical approach towards teaching a content intensive subject in higher education
Prof. James Lambrechts P.E., Wentworth Institute of Technology
Dr. Anuja Kamat, Wentworth Institute of Technology
Ron Frattura

Mini-Project Explorations to Develop Steel and Concrete Gravity System Design Skills
Dr. Ryan Solnosky P.E., Pennsylvania State University, University Park

An EML Project on Steel Beam Design
Dr. Seyed Mohammad Seyed Ardakani P.E., Ohio Northern University

Dr. Robert Schaffer, Mission College
Ms. Varsha Reddy Kandi

Lessons Learned Using Slack in Engineering Education: An Innovation-based Learning Approach
Mr. Enrique Alvarez Vazquez, North Dakota State University
Mr. Manoel Cortes-Mendez, Georgia Institute of Technology
Ryan Striker P.E., North Dakota State University
Ms. Lauren Singelmann, North Dakota State University
Dr. Dan Ewert
Mary Pearson, North Dakota State University
Ms. Ellen M. Swartz, North Dakota State University

Exploration of Technology-aided Education: Virtual Reality Processing Plant for Chemical Engineering Process Design
Ms. Caeley Ashlyn Joy Gibbs, Queen's University

First-Year Engineering Student Perceptions in Programming Self-Efficacy and the Effectiveness of Associated Pedagogy Delivered via an Introductory, Two-Course Sequence in Engineering
Dr. James E. Lewis, University of Louisville
Dr. Brian Scott Robinson, University of Louisville
Mr. Nicholas Hawkins, University of Louisville

Enhancing 3-D Spatial Skills of Engineering Students Using Augmented Reality
Mr. Ali Sheharyar, Texas A&M University at Qatar
Prof. Arun R. Srinivasa, Texas A&M University
Dr. Eyad Masad

M211 - Cooperative and Experiential Education Division Technical Session 4 - Innovating Engineering Education through Industry and Community Partnerships, Maker Spaces, Competitions, Research Initiatives, and Experiential Education
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Cooperative and Experiential Education Division

This session will focus on innovative engineering education through industry and community engagement/partnerships, maker spaces, competitions, research initiatives, and various forms of experiential education. This live (synchronous delivery) session will include a brief overview from each presenter, followed by an interactive question-and-
answer session that allows for focused audience engagement. Before participating in this session, it is advised that the online technical session content (pre-recorded, asynchronous delivery) be reviewed.

### The Community-Engaged College: Grand Valley State University’s Industry and Community Partnership Model
- Casey Thelenwood, Grand Valley State University
- Dr. Paul D. Plotkowski, Grand Valley State University
- Dr. Brent Michael Nowak, Grand Valley State University

### Assessment of Cybersecurity Competition Teams as Experiential Education Exercises
- Dr. Jeremy Straub, North Dakota State University

### The Community-Engaged College: Grand Valley State University’s Industry and Community Partnership Model
- Casey Thelenwood, Grand Valley State University
- Dr. Paul D. Plotkowski, Grand Valley State University
- Dr. Brent Michael Nowak, Grand Valley State University

### Work in Progress: Mechanical Engineering Students’ Incorporation of Stakeholder Considerations throughout a Senior Design Course Sequence
- Valerie Vanessa Bracho Perez, Florida International University
- Anilegna Nunez Abreu, Florida International University
- Mr. Ameen Anwar Khan, Florida International University
- Indhira Maria Hashübn, Virginia Tech
- Dr. Alexandra Coso Strong, Florida International University

### M213B - Design Methodologies 1
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Design in Engineering Education Division
Moderators: Aaron Joya, University of Washington; Robert Nagel, James Madison University

### Work in Progress: Improving Engineering Students’ Need-finding Abilities
- Meagan Flus, University of Waterloo
- Mr. Christopher Rennick, University of Waterloo
- Dr. Ada Hurst, University of Waterloo

### “Where I’ve Been, Where I Am, Where I’m Going”: Exploring Design Awareness through an Undergraduate Student Seminar
- Aaron Justin Joya, Georgetown University
- Khadijah Jordan,
- Ms. Miranda Nicole Washington
- Grace Barar, University of Washington
- Alison Gray, University of Washington
- Ms. Rylie Sweem
- Dr. Cynthia J. Atman, University of Washington

### Teaching Conceptual Design to a Heterogeneous Group: A Workshop Method
- Dr. Sangarappillai Sivaloganathan, United Arab Emirates University
- Prof. Ali H. Al-Marzouqi, United Arab Emirates University
- Dr. Essam K. Zaneldin P.E., United Arab Emirates University

### A Longitudinal Exploration of Students’ Functional Modeling Abilities
- Mr. Henry David Banks, James Madison University

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ASEE’S VIRTUAL CONFERENCE
MONDAY, JUNE 22 SESSIONS

Alexander R. Murphy, Georgia Institute of Technology
Prof. Matt Robert Bohm, Florida Polytechnic University
Dr. Julie S. Linsey, Georgia Institute of Technology
Dr. Robert L. Nagel, James Madison University

Representations Between Engineering Design and Engineering Analysis
Hadi Ali, Arizona State University, Polytechnic campus
Dr. Ann F. McKenna, Arizona State University

Validation of a Mental Model Elicitation Instrument through Deployment of Control Groups in an Undergraduate Engineering Program
Alexander R. Murphy, Georgia Institute of Technology
Henry David Banks, James Madison University
Dr. Matt Robert Bohm, Florida Polytechnic University
Dr. Robert L. Nagel, James Madison University
Dr. Julie S. Linsey, Georgia Institute of Technology

M214A - Student Experiences with Undergraduate Research
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Educational Research and Methods Division
Modators: Vanessa Svihla, University of New Mexico; James Pembridge, Embry-Riddle Aeronautical University - Daytona Beach

A Proposed Survey-based, Student-centered Framework for Evaluation of Undergraduate Research Awareness in Minority-serving Institutions
Dr. Mahmoud Khasawneh, Texas A&M International University
Dr. John C. Kilburn Jr., Texas A&M International University
Dr. Jared Romeo Dmello, Texas A&M International University
Daphne Elizabeth Sanchez, Texas A&M International University
Alicia Segovia, Texas A&M International University

Work in Progress: Undergraduate Research Experiences Survey (URES) and Engineering Identity
Dr. Caitlin Donahue Wylie, University of Virginia
Dr. Kathryn A. Neeley, University of Virginia
Dr. Brian P. Helmke, University of Virginia

Work in Progress: An Undergraduate Theory and Methods of Research Class for Honors Students
Dr. Joseph H. Holles, University of Wyoming

Engineering Resilience through Research Mentorship: Manufacturing Pathways to Careers
Dr. Lara Cristina Perez-Felkner, Florida State University
Ms. Chelsea D. Shore, Florida State University
Dr. Tarik J. Dickens, Florida A&M University
Dr. Mingchua Dawn Yang, Florida A&M University

Assessment and Analysis of Use of Self-regulated Learning in Laboratory-based Expercurricular Undergraduate/First-year Graduate Research Projects
Dr. Wookwon Lee P.E., Gannon University
Dr. Nicholas B. Conklin, Gannon University

M214B - Student Perceptions of Self-efficacy, Success, and Identity
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Educational Research and Methods Division
Modators: Jennifer Turns, University of Washington; James Pembridge, Embry-Riddle Aeronautical University - Daytona Beach

Assess Experiential Learning Outcomes
Tania K. Morimoto, University of California, San Diego
Prof. Nathan Delson, University of California, San Diego
Dr. Carolyn L. Sandoval, University of California, San Diego

Work in Progress: What Makes Courses Demanding in Engineering Education? A Combination of Mixed Methods and Grounded Theory Research
Miss Isabel Hilliger P.E., Pontificia Universidad Católica de Chile
Miss Constanza Melian, Pontificia Universidad Católica de Chile
Miss Javiera Meza, Pontificia Universidad Católica de Chile
Mr. Gonzalo Cortés, Pontificia Universidad Católica de Chile
Dr. Jorge A. Baier, Pontificia Universidad Catholica de Chile

Student Perceptions of and Learning in Maker Spaces Embedded in Their Undergraduate Engineering Preparation Programs
Dr. Louis S. Nadelson, University of Central Arkansas
Dr. Idalis Villanueva, Utah State University
Dr. Jana Bouwma-Gearhart, Oregon State University
Ms. Estefany Soto, University of Central Arkansas
Cindy Ann Lenhart, Oregon State University
Kate Youmans, Utah State University
Yoon Ha Choi, Oregon State University

Expectations in Engineering Programs: Between Social Construction and Internalized Experience
Mr. Hindolo Michael Kamanda, University of Georgia
Mr. Davis George Anderson Wilson, University of Georgia
Dr. Joachim Walther, University of Georgia
Dr. Nicola W. Sochacka, University of Georgia
Dr. Stephen Secules, Florida International University
Dr. James L. Huff, Harding University
An Exploration of Students’ Engineering Identity Development in a PBL Team Setting
Ms. Juebei Chen, Aalborg University
Prof. Anette Kolmos, Aalborg University
Prof. Xiangyun Du, Qatar University

Developing a More Comprehensive Instrument to Assess the Entrepreneurial Mindset of Engineering Students
Dr. Constanza Miranda, Pontificia Universidad Católica de Chile
Sr. Julián Iñaki Goñi, Pontificia Universidad Católica de Chile
Dr. Bruk T. Berhane, Florida International University
Ms. Trinidad Sotomayor, Pontificia Universidad Católica de Chile

M214C - Faculty and Student Perspective on Instructional Strategies
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Educational Research and Methods Division
Moderators: John Tingerthal, Northern Arizona University; James Pembridge, Embry-Riddle Aeronautical University - Daytona Beach

Exploratory Factor Analysis of Approaches to Teaching Inventory (ATI): Use in an Evidence-based Faculty Development Program for Promoting Active Learning Pedagogical Strategies
Kristi Glassmeyer, Arizona State University
Lydia Ross, Arizona State University
Dr. Eugene Judson, Arizona State University
Prof. Stephen J. Krause, Arizona State University
Dr. Lindy Hamilton Mayled, Arizona State University

Student Response to Instructional Practices (StRIP) Survey in Engineering Classrooms: Validating a Spanish Version
Dr. Monica Quezada-Espinoza, Universidad Andres Bello, Chile
Prof. Angeles Dominguez, Tecnologico de Monterrey, Mexico, and Universidad Andres Bello, Chile
Prof. Genaro Zavala, Tecnologico de Monterrey, Mexico, and Universidad Andres Bello, Chile
Dr. Juan Felipe Calderón, Universidad Andres Bello, Chile

Making Improvements: Pedagogical Iterations of Designing a Class Project in a Maker Space
Ms. Roxana Maria Carbonell, University of Texas at Austin
Dr. Audrey Boklage, University of Texas at Austin
Dr. Patricia Clayton, University of Texas at Austin
Dr. Maura Borrego, University of Texas at Austin

M215A - Curricular Advancements in ECE
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Electrical and Computer Division
Moderators: Jennifer Bonnwell, Milwaukee School of Engineering; Huihui Wang, Jacksonville University

A Change Model Approach: Integrating the Evaluation of Synergistic Departmental Efforts to Transform Engineering Education
Brandi Geisinger, Iowa State University
Arlene de la Mora, Iowa State University
Cori J. Hyde
Dr. Diane T. Rover, Iowa State University

Partner Selection and Group-based Curriculum Design for Engineering Laboratory Courses
Dr. Chad Eric Davis P.E., University of Oklahoma
Dr. Paul Moses, University of Oklahoma

Work in Progress: Leveraging Technology Trends to Develop a Skills-based Approach to Engineering Design
Dr. Shiny Abraham, Seattle University
Dr. Kenneth A. Connor, Rensselaer Polytechnic Institute
M216 - ECCD - Technical Session 1 - Energy & Electrical Engineering

10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Energy Conversion and Conservation Division
Moderators: Seyed Mousavinezhad, Idaho State University; Herbert Hess, University of Idaho

Papers presented in this session are related to energy and electrical engineering and their educational aspects.

**Electrical Energy Engineering Education for the 21st Century**
Dr. Radian G. Belu, Southern University and A&M College
Prof. Lucian Ionel Cioca, Lucian Blaga University of Sibiu

**A Multidisciplinary Energy Project: Rebuilding a Non-working Electric Car with Students**
Dr. Faruk Yildiz, Sam Houston State University
Dr. Keith L. Coogler, Sam Houston State University
Dr. Reg Pecen, Sam Houston State University
Dr. Ulan Dakeev, Sam Houston State University

**Teaching Substation Battery Testing to Undergraduates**
Dr. Glenn T. Wrate P.E., Northern Michigan University

**Voltage and Current Loop Controlled Three-stage, Three-port Solid State Transformer**
Mr. Abdullah Al Hadi, Texas A&M University-Kingsville
Dr. Rajab Challoo, Texas A&M University-Kingsville

**Harnessing Drag Energy in Electric Automobiles**
Mr. Aman Luthra, University of Georgia
Dr. Tom Lawrence P.E., University of Georgia
Dr. John M. Mativo, University of Georgia

M218 - Engineering Design Graphics Division Technical Session 4

10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Design Graphics Division
Moderator: Hannah Budinoff, University of California, Berkeley

A potpourri of ideas that will be of interest to design graphics instructors and others with an interest in design graphics instruction.

**Challenges of Developing a New Engineering Drawings Course for Civil Engineers**
Mr. Bradley James Schmid, University of Saskatchewan

**CAD for College: Switching to Onshape for Engineering Design Tools**
Ms. Kate N. Leipold, Rochester Institute of Technology

**Conceptual Cylinder Head CAD Project for Assessment**
Mr. Eric Leonhardt, Western Washington University

**Engineering Application with a Visual Aid and an Experimental Setup**
Dr. Nandita Biswas, Washington State University
Mr. David Torick, Washington State University

M221 - Information Literacy in First-year Courses and Co-curricular Experiences

10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Libraries Division
Moderators: Julie Arendt, Virginia Commonwealth University; Ken Carriveau, Baylor University

**Promoting Engineering Research Early – A Case Study of Research Question Formulation in a First-year Engineering Course**
Ms. Joanne Dera, New Jersey Institute of Technology
Dr. Ashish D. Borgaonkar, New Jersey Institute of Technology
Dr. Davida Scharf, New Jersey Institute of Technology
Dr. Jaskirat Sodhi, New Jersey Institute of Technology

**A First-year Engineering Information Literacy Workshop to Increase Student Awareness of Research Databases**
Ms. Evie Cordell, Northeastern University
Alissa P. Link Cilfone, Northeastern University
Dr. Susan F. Freeman, Northeastern University
Dr. Richard Whalen, Northeastern University
Ms. Brooke Davis Williams, Northeastern University

**Work in Progress: Using a Second Intervention to Continue Improving Information Literacy Outcomes in a First-year**
M224 - ENT Division Technical Session: EM Across the Curriculum I
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Entrepreneurship & Engineering Innovation Division
Moderator: Jason Forsyth, James Madison University
Implementing Entrepreneurial Mindset Learning (EML) in a Timber Design Course
Dr. Seyed Mohammad Seyed Ardakani, Ohio Northern University
Incorporating an Entrepreneurial Mindset Competition into a Structural Analysis Course
Dr. Seyed Mohammad Seyed Ardakani, Ohio Northern University

M225 - Emphasizing Communication and the Humanities in Environmental Engineering
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Environmental Engineering Division
Moderators: Charles Sprouse, Benedictine College; Andrew Pfluger, United States Military Academy; Fethiye Ozis, Northern Arizona University
Integration of Environmental Humanities Modules into the Environmental Engineering Classroom
Dr. Sarah K. Bauer, Rowan University
Machine-assisted Analysis of Communication in Environmental Engineering
Dr. Roman Taraban, Texas Tech University
Mr. David Robledo, Texas Tech University
Dr. Francesco V. Donato, Texas Tech University
Dr. Ryan C. Campbell, Texas Tech University
Dr. Jeong-Hee Kim, Texas Tech University
Dr. Danny D. Reible, Texas Tech University
Dr. Chongzheng Na, Texas Tech University
Technical Communications in an Environmental Engineering Curriculum: A Framework for Analysis and Continual Improvement
Mr. Caleb James McCollum, United States Military Academy

Schedule subject to change. Please go to www.asee20.pathable.co for up-to-date information
M226 - Experimentation and Laboratory-oriented Studies
Division Technical Session 1
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Experimentation and Laboratory-Oriented Studies Division
Moderator: Sevile Mannickarottu, University of Pennsylvania

A Reproducible Solution for Implementing Online Laboratory Systems Through Inexpensive and Open-source Technology
Dr. Philip Jackson, University of Florida
Mr. Joshua Rudaitis, University of Florida

A Project-based Online Experimentation Course
Prof. Ahmet Can Sabuncu, Worcester Polytechnic Institute
Prof. John M. Sullivan Jr., Worcester Polytechnic Institute

Redesigning an Experimentation Course with PBL Pedagogy to Support Accreditation in China
Dr. Lijun Zhang, Beijing Institute of Technology
Dr. Dongxiao Wang, Beijing Institute of Technology
Dr. Xiaofeng Tang, Ohio State University
Prof. Zhonglai Zhang, Beijing Institute of Technology
Prof. Hai Lin, Beijing Institute of Technology
Dr. Ying Wang

Pair-to-Pair Peer Learning
Dr. Nebojsa I. Jaksic, Colorado State University, Pueblo

M227 - First-Year Programs: Maker Spaces in the First Year
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: First-Year Programs Division
Moderators: Kaitlin Mallouk, Rowan University; Jack Bringardner, New York University Tandon School of Engineering

Makers and makerspace usage in the first year.

Addressing First-Year Interest in Engineering via a Makerspace-based Introduction to Engineering Course
Dr. Brian Scott Robinson, University of Louisville
Dr. James E. Lewis, University of Louisville
Mr. Nicholas Hawkins, University of Louisville
Ms. Teresa Lee Tinnell, University of Louisville

Developing Technical Self-efficacy through a Maker-inspired Design Project
Dr. Jennifer S Mullin, UC Davis

Employment of Active Learning Pedagogy Throughout a Maker-Space-Based, First-Year Introduction to Engineering Course
Mr. Nicholas Hawkins, University of Louisville
Dr. James E. Lewis, University of Louisville
Dr. Brian Scott Robinson, University of Louisville

Results of Integrating a Maker Space into a First-Year Engineering Course
Dr. Stephanie M Gillespie, University of New Haven
Dr. Goli Nossoni, University of New Haven

M228 - Growing and Maintaining Graduate Enrollment
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Graduate Studies Division
Moderators: Jeffrey Fergus, Auburn University; La'Tonia Stiner-Jones, Ohio State University

Dramatically Growing a Graduate Program: A Seed Investment
Dr. Shannon Barker, University of Virginia
Dr. Amy Clobes, University of Virginia
Dr. Jasmine D. Crenshaw, University of Virginia

A Systematized Literature Review of the Factors that Predict the Retention of Racially Minoritized Students in STEM Graduate Degree Programs
Miss Fantasi Nicole Curry, Purdue University, West Lafayette
Prof. Jennifer DeBoer, Purdue University, West Lafayette

Work in Progress: Increasing Communication Avenues Between Mechanical Engineering Doctoral Students, Faculty, and Administration
Adrienne K. Scott, University of Colorado, Boulder
Dr. Madalyn D. Kern, University of Colorado, Boulder
Dr. Julie E. Steinbrenner, University of Colorado, Boulder

M229 - Industrial Engineering Division Technical Session 1
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Industrial Engineering Division
Moderator: Lisa Bosman, Purdue University at West Lafayette

Assessing Instructional Effectiveness and Understanding Factors that Contribute to Student Performance in an Engineering Statistics Course: An Exploratory Study
Dr. James Burns, Western Michigan University
Mrs. Enas Aref, Western Michigan University
Mr. Mohammad Majd, Western Michigan University
Creating a Community of Practice for Operations Research by Co-creating a High-impact Executive Education Program in India

- Dr. Venugopalan Kovaichelvan, TVS Institute for Quality and Leadership, TVS Motor Company Ltd.
- Dr. Abhijit Deshmukh, Purdue University, West Lafayette
- Dr. Patrick A. Brunese, Purdue University, West Lafayette

Incorporating Divergent Thinking Skills Development into a Project-based Course in Industrial and Systems Engineering

- Prof. Elif Akcali, University of Florida
- Prof. Wayne C.W. Giang, University of Florida
- Ms. McKenzie Landrum, University of Florida

Applying Artificial Intelligence to the Beer Game

- Dr. Lisa Bosman, Purdue University, West Lafayette
- Dr. Asasakiran Madamanchi, Purdue University, West Lafayette
- Dr. Scott R. Bartholomew, Purdue University, West Lafayette
- Ventria L. Byrd, Purdue University, West Lafayette

M258 - Welcome Session
9:30 A.M. - 9:55 A.M.
Sponsor: ASEE Board of Directors
Welcome session featuring ASEE President Stephanie Adams
Musical entertainment provided by Kai Kight, Innovative Musician

M271B - NSF Grantees: RED 1
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: NSF Grantees Session
Moderators: Amber Genau, University of Alabama at Birmingham; S. Patrick Walton, Michigan State University
Presentations from groups with NSF "Revolutionizing Engineering Departments" (RED) grants

Developing Changemaking Engineers – Year Five

- Dr. Susan M. Lord, University of San Diego
- Dr. Rick Olson, University of San Diego
- Dr. Chell A. Roberts, University of San Diego
- Dr. Caroline Baillie, University of San Diego
- Dr. Odesma Onika Dalrymple, University of San Diego
- Dr. Leonard A. Perry, University of San Diego

The Impact of an Intensive Design Experience on Self-Efficacy, Valuation of Engineering Design, and Engineering Identity in Undergraduate Engineering Students

- Dr. Uzoma M. Monye, North Carolina Agricultural and Technical State University
- Dr. Tobin N. Walton, North Carolina Agricultural and Technical State University

Revolution in CEE: Sustainability and Barriers

- Dr. Milo Koretsky, Oregon State University
- Dr. Susan Bobbitt Nolen, University of Washington
- Michelle Kay Bothwell, Oregon State University
- Dr. Devlin Montfort, Oregon State University
- Dr. Susannah C. Davis, Oregon State University
- Dr. Christine Kelly, Oregon State University

Engineering with Engineers: Fostering Engineering Identity through Industry Immersion

- Dr. Yen-Lin Han, Seattle University
- Dr. Kathleen E. Cook, Seattle University
- Dr. Gregory Mason P.E., Seattle University
- Dr. Teodora Rutar Shuman, Seattle University
- Dr. Jennifer A. Turns, University of Washington

The RED Teams Start-Up Session: Leveraging Research with Practice for Success in Academic Change

- Dr. Julia M. Williams, Rose-Hulman Institute of Technology
- Dr. Sriram Mohan, Rose-Hulman Institute of Technology
- Dr. Eva Andrijcic, Rose-Hulman Institute of Technology
- Dr. Cara Margherio, University of Washington
- Dr. Elizabeth Litzler, University of Washington
- Kerice Doten-Snitker, University of Washington

M271 - NSF Grantees: RED 2 / Civil Engineering
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: NSF Grantees Session
Moderators: Amber Genau, University of Alabama at Birmingham; Susan Lord, University of San Diego
Presentations from groups with NSF "Revolutionizing Engineering Departments" (RED) grants in civil engineering and other grants related to leadership and workforce development in CEE.

Impacts of Diversity and Inclusion Initiatives in a Civil and Environmental Engineering Department

- Mr. Tiago R. Forin, Rowan University
- Dr. Stephanie Farrell, Rowan University
- Dr. Kauser Jahan P.E., Rowan University
- Stephanie Lezotte, Rowan University
- Dr. Beena Sukumaran, Rowan University
- Prof. Harriet Hartman, Rowan University
- Dr. Ralph Alan Dusseau P.E., Rowan University
- Theresa F.S. Bruckerhoff, Curriculum Research & Evaluation, Inc.
ASEE’S VIRTUAL CONFERENCE
MONDAY, JUNE 22 SESSIONS

Dr. Sarah K. Bauer, Rowan University
Developing Inclusive Engineers: Teaching Peer-Mentors
Principles of Equity and Inclusion
Dr. Jennifer Harper Ogle, Clemson University
Ms. Candice W. Bolding, Clemson University
Julianna A. Lloyd, Clemson University
Mr. Logan C. Wade
Preparing the Future Workforce of Architecture, Engineering, and Construction for Robotic Automation Processes
Dr. Mohamed ElZomor, Florida International University
Mr. Piyush Pradhananga, Florida International University
Ms. Gabriella Santi
Prof. Shahin Vassigh, Florida International University
Defining Workforce Development: Launching a Career from CAREER
Dr. Madeline Polmear, University of Florida
Dr. Denise Rutledge Simmons P.E., University of Florida
Developing Leadership in Civil Engineering: Turning Students’ Hindsight into Others’ Foresight
Dr. Madeline Polmear, University of Florida
Dr. Denise Rutledge Simmons P.E., University of Florida
Dr. Nicholas Anthony Clegorne

M301 - Aerospace Student Projects, Engineering Design and Research
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Aerospace Division
Moderators: Tracy Yother, Purdue Polytechnic Institute; Nadir Yilmaz, Howard University
Drone Construction and Racing for Pre-College Students
Dr. Michael C. Hatfield, University of Alaska Fairbanks
Dr. Catherine F. Cahill, University of Alaska Fairbanks
Dr. Peter W. Webley, University of Alaska Fairbanks
Results from the University of Alaska Fairbanks’ AIAA Student Club Design, Build, Fly Competition 2019
Levi Purdy, University of Alaska Fairbanks
Dr. Michael C. Hatfield, University of Alaska, Fairbanks
Michael Radotich
Brian C. Holst, University of Alaska Fairbanks
Lighter-than-air Vehicles as Aerospace-focused Projects in a Mechanical Engineering Capstone Sequence
Dr. Wilhelm A. Friess, University of Maine

M302 - Architectural Engineering Division Technical Session 2
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsors: Architectural Engineering Division; Construction Engineering Division
Moderator: Darrell Nickolson, Indiana University - Purdue University Indianapolis
Architectural Design as a Way for Civil Engineers to Learn Building Systems and BIM
Dr. James B. Pocock, U.S. Air Force Academy
Dr. Patrick Charles Suermann P.E., Texas A&M University
Challenges and Opportunities Observed in the Implementation of a New Architectural Engineering Undergraduate Academic Program
Prof. Scott Walbridge P.E., University of Waterloo
Dr. Rania Al-Hammoud P.Eng., University of Waterloo
Implementing Bluebeam Software in Architectural Engineering Design Courses
Michael James Deigert P.E., California Polytechnic State University, San Luis Obispo
Dr. Anahtid Behrouzi, California Polytechnic State University, San Luis Obispo
Dr. Pamela A. Brady, California Polytechnic State University, San Luis Obispo

M304 - Teaching Interventions in Biomedical Engineering (Works in Progress) - June 22nd
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Biomedical Engineering Division
Moderators: Aileen Huang-Saad, University of Michigan; Alexis Ortiz-Rosario, Ohio State University
Development of a Video Analysis Software for Biomechanics Education
Dr. Hirohito Kobayashi, University of Wisconsin, Platteville
Incorporating Sustainability into a Bioethics Course: A Case Study
Dr. Arash Mahboobin, University of Pittsburgh
Dr. David V.P. Sanchez, University of Pittsburgh
Switching Modalities: Implications of Online Education in Biomedical Engineering
Dr. Vignesh Subbian, University of Arizona
Mr. Daniel B. Whitaker, University of Arizona

Schedule subject to change. Please go to www.asee20.pathable.co for up-to-date information
WIP: Improving Student Engagement in Undergraduate Bioinformatics Through Research Contributions
Dr. Jessica Dare Kaufman, Endicott College

WIP: Direct Incorporation of Research Articles into Undergraduate Biomedical Engineering Courses to Contextualize Complex Topics
Prof. Mark A. Chapman, University of San Diego
Dr. G. Bryan Cornwall, University of San Diego

WIP: Embedded Ethical Inquiry and Reflection in a Biomedical Engineering Curriculum
Dr. Sharon Miller, Indiana University Purdue University, Indianapolis
Dr. Steven Higbee, Indiana University Purdue University, Indianapolis
Prof. Joseph M. Wallace, Indiana University Purdue University, Indianapolis
Dr. John H. Schild, Indiana University Purdue University, Indianapolis
Dr. Julie Y. Ji

M306A - Before the Capstone: Project-based Experiences Early in the Curriculum
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Civil Engineering Division
Moderator: Camilla Saviz, University of the Pacific

This session includes papers describing approaches to project-based learning in freshman and sophomore years of the curriculum.

Incorporating Life Cycle Assessment in an Introduction to Engineering Course
Dr. Mary Roth, Lafayette College
Dr. Haritha Malladi, Lafayette College

Engaging Civil Engineering Students through a “Capstone-like” Experience in their Sophomore Year
Dr. Wayne Sarasua, Clemson University
Dr. Nigel Berkeley Kaye, Clemson University
Dr. Jennifer Harper Ogle, Clemson University
Mr. Mehdi Nassim Benaissa, Clemson University
Dr. Lisa Benson, Clemson University
Dr. Bradley J. Putman, Clemson University
Dr. Aubrie Lynn Pfirman, Lander University

Modernizing an Introductory Civil Engineering Course with Project-Based Learning
Dr. John Komlos, Villanova University
Dr. Stephanie L. Walkup, Villanova University
Dr. Kevin A. Waters, Villanova University

Peer Mentorship and a 3D Printed Design-Build-Test Project: Enhancing the First Year Civil Engineering Experience
Dr. Nicholas Andres Brake, Lamar University
Prof. Thinesh Selvaratnam

M306B - Beyond the Capstone: Integrating Authentic Experiences that Promote Learning and Excitement
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Civil Engineering Division
Moderator: Matthew Lovell, Rose-Hulman Institute of Technology

This session includes papers providing insights into the civil engineering capstone experience and introducing ways to go beyond the traditional project-based learning.

Development and Implementation of a Final Year Civil Engineering Capstone Project – Successes, Lessons Learned, and Path Forward
Dr. Andrew C. Brown P.E., University of Auckland
Mr. Hugh Watson Morris, University of Auckland, NZ

Scaffolding and Assessing Sustainable Design Skills in a Civil Engineering Capstone Design Course
Dr. Elise Barrella P.E., Wake Forest University
Dr. Mary Katherine Watson, The Citadel
Mr. Justyn Daniel Girdner, James Madison University
Dr. Robin Dawn Anderson, James Madison University

Beyond the Capstone: National Competition and Community Engagement in a Timber Bridge Senior Project
Dr. Bin (Brenda) Zhou P.E., Central Connecticut State University
Sylwia Tanski, Fuss & O’Neill, Inc.

Civil Engineering Capstone Inventory: Standards of Practice & The ASCE Body of Knowledge
Dr. Jennifer Retherford P.E., The University of Tennessee at Knoxville
Dr. Beth Lin Hartmann, Iowa State University
Dr. Rania Al-Hammoud P.Eng., University of Waterloo
Dr. George A Hunt P.E., University of Nebraska, Lincoln
ASEE’S VIRTUAL CONFERENCE
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#ASEEVC

M308 - Computers in Education Division Technical Session 2: Teaching and Learning
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Computers in Education Division
Moderators: Robert Avanzato, Pennsylvania State University, Abington; Ronald Hayne, The Citadel

General teaching and learning will be the topics of this session. Papers selected fit into one or both of these categories.

Improving Student Learning through Classroom Engagement

   Dr. Eddie Davis, SUNY Farmingdale

Work in Progress: Analysis of the Impact of Office Hours on Graded Course Assessments

   Natalia Ozymko, University of Illinois at Urbana - Champaign
   Matthew Allan McCarthy, University of Illinois at Urbana - Champaign
   Prof. Wade Fagen-Ulmschneider, University of Illinois at Urbana - Champaign
   Prof. Karin Jensen, University of Illinois at Urbana - Champaign
   Karle Flanagan, University of Illinois at Urbana - Champaign

Toward a Multi-dimensional Biometric Approach to Quantifying Student Engagement in the STEM Classroom

   Dr. James Christopher Foreman, University of Louisville
   Dr. Aly Farag, University of Louisville
   Dr. Asem Ali, University of Louisville
   Islam Alkabbany, University of Louisville
   Dr. Marci S. DeCaro, University of Louisville
   Dr. Thomas Tretter, University of Louisville

Computerized Exam Reviews: In-person and Individualized Feedback to Students after a Computerized Exam

   Wayne L. Chang, University of Illinois at Urbana - Champaign
   Prof. Matthew West, University of Illinois at Urbana - Champaign
   Prof. Craig Zilles, University of Illinois at Urbana - Champaign
   David Mussulman, University of Illinois at Urbana - Champaign
   Carleen Sacris, University of Illinois at Urbana - Champaign

M311 - Cooperative and Experiential Education Division Technical Session 2 - Development, Assessment, and Impact of Experiential Education
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Cooperative and Experiential Education Division
Moderators: Casey Thelenwood, Grand Valley State University; Katherine McConnell, University of Colorado Boulder

This session will provide a best-practices overview of the development, assessment, and impact of engineering experiential education. This live (synchronous delivery) session will include a brief overview from each presenter, followed by an interactive question-and-answer session that allows for focused audience engagement. Before participating in this session, it is advised that the online technical session content (pre-recorded, asynchronous delivery) be reviewed.

Developing a Framework for Experiential Learning

   Dr. John H. Callewaert, University of Michigan
   Dr. Joanna Mirecki Millunchick, University of Michigan
   Cassandra Sue Ellen Woodcock, University of Michigan
   Mr. Kevin Cai Jiang, University of Michigan
   Stacie Edington, University of Michigan

The Influence of Experiential Learning on Student Professional Development: A Literature Review

   Beata Johnson, Purdue University at West Lafayette
   Dr. Joyce B. Main, Purdue University at West Lafayette

Students’ Perception of Collaborative Online International Learning

   Dr. Philip Appiah-Kubi, University of Dayton
   Ms. Jennifer Nichwitz, University of Dayton

Longitudinal Study to Develop and Evaluate the Impacts of a “Transformational” Undergraduate ECE Design Program: Study Results and Best Practices Report

   Dr. Rachael E. Cate, Oregon State University
   Donald Heer, Oregon State University
ASEE’S VIRTUAL CONFERENCE
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**M313A - Capstone Pedagogy**
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Design in Engineering Education Division
Moderators: Bob Rhoads, Ohio State University; Austin Talley, Texas State University

**Work In Progress: Is Our Capstone Mentorship Model Working?**
Dr. C. Richard Compeau Jr., Texas State University
Dr. Austin Talley P.E., Texas State University

**Evaluating ABET Student Outcome (5) in a Multidisciplinary Capstone Project Sequence**
Dr. Nicholas A Baine P.E., Grand Valley State University
Dr. Karl Brakora, Grand Valley State University
Dr. Christopher P. Pung P.E., Grand Valley State University

**Collaborative Project-based Learning Capstone for Engineering and Engineering Technology Students**
Dr. Andrew P. Ritenour, Western Carolina University
Dr. Chip W. Ferguson, Western Carolina University
Dr. Patrick Gardner, Western Carolina University
Mr. Brett Ronald Banther, Western Carolina University
Dr. Jeffrey L. Ray, Western Carolina University

**An Integrated Multi-year Iterative and Service-oriented Capstone Project**
Dr. Joyce Blandino P.E., Virginia Military Institute
Col. Jon-Michael Hardin P.E., Virginia Military Institute

**Drones for Project-based Learning (PBL) Capstone Design**
Dr. Stephen Andrew Wilkerson P.E., York College of Pennsylvania
Dr. Stephen Andrew Gadson, University of Guelph
Ms. Amy Domenique Gadson, University of Alberta
Miss Elyse Hill

Prof. Niina Nurmi, Aalto University, School of Business

**Implementing Product Dissection in Virtual Classrooms**
Prof. Andrea M. Ragonese, Pennsylvania State University, University Park
Dr. Elizabeth Marie Starkey, Pennsylvania State University, University Park

**Developing a Bridging Language: Design Decisions in Informal Making Experiences**
Kathryn Elizabeth Shroyer, University of Washington

**Prominence of Conceptual Design with Computer-Aided Design Tools for Junior and Senior Product Designers**
Mr. Arash Nourimand, University of Toronto
Dr. Alison Olechowski, University of Toronto

**The Imminent Educational Paradigm Shift: How Artificial Intelligence will Reframe how we Educate the Next Generation of Engineering Designers**
Mr. Cheng Chen, University of Georgia
Mr. Toluwalase Oluwagbemileke Olajoyegbe, University of Georgia
Dr. Beshoy Morkos, University of Georgia

Prof. Todd M. Fernandez, Georgia Institute of Technology
Dr. Kaela M. Martin, Embry-Riddle Aeronautical University
Prof. Richard T. Mangum, Embry-Riddle Aeronautical University
Dr. Cristi L. Bell-Huff, Georgia Institute of Technology

**M314A - Alternatives to Traditional Assessment**
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Educational Research and Methods Division
Moderators: Elizabeth Starkey, Pennsylvania State University; Kathryn Shroyer, University of Washington

**Whose Grade Is It Anyway?: Transitioning Engineering Courses to an Evidence-based Specifications Grading System**
Prof. Todd M. Fernandez, Georgia Institute of Technology
Dr. Kaela M. Martin, Embry-Riddle Aeronautical University
Prof. Richard T. Mangum, Embry-Riddle Aeronautical University
Dr. Cristi L. Bell-Huff, Georgia Institute of Technology
Privileging Learning Over Numbers: Developing an Alternative Student Assessment in Engineering
   Dr. Eleazar Marquez, Rice University
   Dr. Samuel Garcia Jr., Texas State University

Student-developed Learning Objectives: A Form of Assessment to Enable Professional Growth
   Ms. Lauren Singelmann, North Dakota State University
   Mr. Enrique Alvarez Vazquez, North Dakota State University
   Ms. Ellen M. Swartz, North Dakota State University
   Mary Pearson, North Dakota State University
   Ryan Striker P.E., North Dakota State University
   Dr. Dan Ewert

Leveraging the Force of Formative Assessment and Feedback for Effective Engineering Education
   Prof. Junaid Qadir, Information Technology University, Lahore, Pakistan
   Dr. Abd-Elhamid M. Taha, Alfaisal University
   Prof. Kok-Lim Alvin Yau, Sunway University
   Dr. Ing. João Ponciano, University of Glasgow
   Dr. Sajjad Hussain, University of Glasgow
   Prof. Ala Al-Fuqaha, Hamad Bin Khalifa University
   Prof. Muhammad Ali Imran P.E., University of Glasgow

Oral Formative Assessment as a Means to Increasing Total Learning and Engagement in an Engineering University Classroom
   Dr. Kristen M. Ward, Arizona State University
   Dr. Yingyan Lou, Arizona State University

M314B - Care and Inclusive Teaching
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Educational Research and Methods Division
Moderators: Elif Miskioglu, Bucknell University; James Pembridge, Embry-Riddle Aeronautical University - Daytona Beach

Practices in Engineering Education
   Kenya Z. Mejia, University of Washington
   Dr. Jennifer A. Turns, University of Washington

What is Care in Engineering Teaching?
   Dr. Jorge A. Baier, Pontificia Universidad Católica de Chile
   Miss Isabel Hilliger P.E., Pontificia Universidad Católica de Chile
   Mrs. Ximena Hidalgo, Pontificia Universidad Católica de Chile
   Miss Constanza Melian, Pontificia Universidad Católica de Chile

Work in Progress: Exploring an Engineering Faculty’s Intention Toward Inclusive Teaching

M314C - Teaching Assistants, Supplemental Instruction, and Classroom Support
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Educational Research and Methods Division
Moderators: John Chen, California Polytechnic State University, San Luis Obispo; James Pembridge, Embry-Riddle Aeronautical University - Daytona Beach

Utilizing Peer Learning Assistants to Improve Student Outcomes in an Introductory ECE Course
   Dr. David John Orser, University of Minnesota, Twin Cities
   Kyle Dukart, University of Minnesota, Twin Cities
   Prof. Changhyun Choi, University of Minnesota, Twin Cities
   Frances Wood, University of Minnesota, Twin Cities

The Impact of Teachers’ Interventions on Collaborative Problem Solving Interactions in Undergraduate Engineering Classrooms
   Dr. Saadeddine Shehab, University of Illinois at Urbana - Champaign

Work in Progress: Motivations and Outcomes of an Undergraduate Teaching Assistantship Program
   Mr. Barukh Ben Rohde, University of Florida
   Dr. Elliot P. Douglas, University of Florida

Increased Performance via Supplemental Instruction and Technology in Technical Computing

M315 - Assessment of Learning in ECE Courses
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Electrical and Computer Division
Moderators: Jennifer Bonniwell, Milwaukee School of Engineering; Huihui Wang, Jacksonville University

Bidirectional and Collaborative Feedback Between Instructors and Students for Scholarship of Teaching and Learning (SoTL)
   Prof. Jinhui Wang, University of South Alabama

Can ABET Assessment Really Be This Simple?
   Dr. Claire Lynne McCullough P.E., High Point University
ASEE’S VIRTUAL CONFERENCE
MONDAY, JUNE 22 SESSIONS #ASEEVC

Outcomes-based Assessment Instrument for Engineering Problem-solving Skills

Miss Bahar Memarian, University of Toronto
Dr. Susan McCahan, University of Toronto

Student Performance in Partially Flipped ECE Laboratory Classes

Dr. Ahmed Dallal, University of Pittsburgh
Dr. April Dukes, University of Pittsburgh
Dr. Renee M. Clark, University of Pittsburgh

Work in Progress: A Longitudinal Study of Students’ Conceptual Understanding of Signals and Systems

Caroline Crockett, University of Michigan
Dr. Cynthia J. Finelli, University of Michigan
Dr. Harry Courtney Powell, University of Virginia

Continuous Improvement in Teaching Microprocessor Systems Design: A Review of Efforts in Using Different Tools, Techniques, and Methods to Satisfy Students’ Needs

Prof. Jie Sheng, University of Washington, Tacoma

M315B - Insights for Teaching ECE Courses
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Electrical and Computer Division
Moderators: Jennifer Bonniwell, Milwaukee School of Engineering; Huihui Wang, Jacksonville University

Work in Progress: Building Community, Providing Scholarships, Developing Leaders: Recruiting and Retaining Underrepresented Students in Engineering and Computer Engineering Departments

Mr. Kent A. Crick, Iowa State University
Mr. Matthew T. Seipel, Iowa State University
Dr. Lisa M. Larson Ph.D., Iowa State University
Prof. Mack Shelley, Iowa State University

Incorporating Diversity and Inclusion in the Computing Classroom

Dr. Bridget Benson, California Polytechnic State University, San Luis Obispo
Joseph Callenes, California Polytechnic State University, San Luis Obispo
Dr. Amin Malekmohammadi, California Polytechnic State University, San Luis Obispo

Student Sense of Community Through an Introductory Computer Programming Course Sequence

Dr. Laura K. Alford, University of Michigan
Dr. Amir Kamil, University of Michigan
Dr. Andrew DeOrio, University of Michigan

Not Standing at the Same Starting Line: Investigation of Prior Programming Experience on Student Performance in an Introductory Programming Course in ECE

Ms. Ziyue Li, University of Illinois, Urbana-Champaign
Prof. Yuting W. Chen, University of Illinois, Urbana-Champaign

M320 - New Media for Ethics Education
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Ethics Division
Moderators: Buse Aktas, Harvard University; Hamid Khan, Our Lady of the Lake University

Science Fiction as an Entry Point for Ethical Frameworks in Engineering and Computer Science Education

Dr. Valerie H. Summet, Rollins College
Prof. Rebecca A. Bates, Minnesota State University, Mankato

Let’s Get Ethical: Incorporating “The Office” and Engaging Practices into an Ethics Module for Capstone Students

Dr. Joshua Gargac, University of Mount Union

A Simulation for Exploring Ethical Situations that Arise from Conflicting Product Goals

Prof. Allen R. White, Rose-Hulman Institute of Technology

M321 - Improving and Understanding Engineering Collections and Publication
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Libraries Division
Moderators: Amanpreet Kaur, University of Pennsylvania; Michael White, Queen’s University

Collecting and Selecting: A Tale of Training and Mentorship

Ms. Angela Henshilwood, University of Toronto
Ms. Cristina Sewerin, University of Toronto
Mrs. Michelle Spence, University of Toronto
Mindy Thuna, University of Toronto
Dr. Tracy Zahradnik, University of Toronto


Ms. Qianjin Zhang, University of Iowa

Improving Access to Standards

Ms. Susan B. Wainscott, University of Nevada, Las Vegas
Mr. Richard J. Zwiercan, University of Nevada, Las Vegas

Using Citation Analysis as a Collections Management Tool

Mr. Paul McMonigle, Pennsylvania State University, University Park
Inter-university Bibliometric Comparison of Research Output within Engineering Departments: A Small-scale Case Study at the University of Central Florida and the University of Miami

Mr. James Sobczak, University of Miami
Mr. Buenaventura Basco, University of Central Florida

M323A - New Directions for ET
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Technology Division
Moderator: Chandra Asthana, Elizabeth City State University

A Systematized Literature Review of Student Learning, Participation, and Engagement Experience in Engineering Massive Open Online Courses (MOOCs)
Mrs. Huma Shoaib, Purdue University

Evaluation of Open Educational Resources (OER) Use in Construction Management Technology Courses
Dr. Michael Shenoda, State University of New York

Public Perception of Engineering Technology: A Literature Review
Dr. Anne M. Lucietto, Purdue University
Ms. Shelly Tan, Purdue University
Liza Ann Russell, Purdue University
Prof. Mary E. Johnson, Purdue University

M323B - Capstone/ET Projects I: Electrical and Computer Focus
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Technology Division
Moderator: Kevin Cook, Montana State University - Bozeman

A Control Systems Course Project Serving as a Bridge to a Capstone Course and Research Projects
Dr. Wei Zhan, Texas A&M University
Dr. Byul Hur, Texas A&M University
Dr. Boong Yeol Ryoo, Texas A&M University

A New Hands-on Laboratory Approach for Teaching Electromagnetic Concepts to Engineering and Engineering Technology Students
Dr. Jay R. Porter, Texas A&M University
Dr. Anthony T. Cahill, Texas A&M University
Prof. Ricardo Eusebi, Texas A&M University

Assessment of Firefighters’ Exposure and Response to a High-intensity Virtual Reality Simulation
Dr. Ulan Dakeev, Sam Houston State University

Dr. Ali Aljaroudi, Sam Houston State University
Dr. Faruk Yildiz, Sam Houston State University
Dr. Reg Recayi Pecen, Sam Houston State University

Introduce Virtual Reality to College Technical Training Programs—Intensified VR Training for Safety and Economic Efficiency
Dr. Xiaoxia Li, Texas A&M University, Kingsville
Dr. Farzin Heidari, Texas A&M University, Kingsville

Upgrading of a Data Communication and Computer Networks Course in Engineering Technology Program
Dr. Murat Kuzlu, Old Dominion University
Dr. Otilia Popescu, Old Dominion University

M324 - ENT Division Technical Session: First-year Experiences
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsors: Entrepreneurship & Engineering Innovation Division; First-Year Programs Division
Moderator: Jason Forsyth, James Madison University

Building Toys for Children by Applying Entrepreneurial-minded Learning and Universal Design Principles
Dr. Scott Streiner, Rowan University
Dr. Cheryl A. Bodnar, Rowan University
Dr. Kaitlin Mallouk, Rowan University
Dr. Kevin D. Dahm, Rowan University

First-year Engineering Students’ Interpretation of Curiosity in the Entrepreneurial Mindset Through Reflective Practice
Courtney A. LeMasney, Rowan University
Hayley M. Shuster, Rowan University
Dr. Kaitlin Mallouk, Rowan University

Integration of Entrepreneurial-minded Learning
Dr. Deborah M. Grzybowski, Ohio State University
Dr. Xiaofeng Tang, Ohio State University
Eunjeong Park, Ohio State University
Alexia Leonard, Ohio State University
Jack DeLano
Dr. Kai Zhao, Florida State University

Student Responses to Active-learning Strategies: A Comparison Between Project-based and Traditional Engineering Programs
Dr. Elizabeth Pluskwik, Minnesota State University, Mankato
Dr. Yuezhou Wang, Minnesota State University, Mankato

Schedule subject to change. Please go to www.asee20.pathable.co for up-to-date information
M326 - Experimentation and Laboratory-oriented Studies Division Technical Session 6
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Experimentation and Laboratory-Oriented Studies Division
Moderator: Robert Rabb, The Citadel
BYOE: Microelectronic Nonidealities Laboratory Explorations
Mr. Kip D. Comley, Duke University
Mr. Alexander Gregory Culbert, Duke University
Prof. Aaron Franklin, Duke University
BYOE: A Flexible System for Visualizing Switching Regulator Operation
Dr. Harry Courtney Powell, University of Virginia
Kay Hutchinson, University of Virginia
BYOE: Design and Development of a Simple Robotic Arm
Dr. Iftekhar Ibne Basith, Sam Houston State University
Mr. Brandon Marroquin, Sam Houston State University
BYOE: SeaKatz – An Underwater Robot
Dr. Iftekhar Ibne Basith, Sam Houston State University
Mr. Emanuel A. Sanchez, Sam Houston State University
BYOE: Determining Pressure Inside Thin-walled Vessels Using Strain Measurements
Prof. Ahmet Can Sabuncu, Worcester Polytechnic Institute
Mr. Mengqiao Yang, Worcester Polytechnic Institute
Prof. John M. Sullivan Jr., Worcester Polytechnic Institute

M328 - Pedagogy and Teaching Preparation in Graduate Programs
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Graduate Studies Division
Moderators: Diane Peters, Kettering University; Jeffrey Fergus, Auburn University
Modifications to a Graduate Pedagogy Course to Promote Active Learning and Inclusive Teaching
Ms. Kara Danielle Fong, University of California, Berkeley
Dr. Shannon Ciston, Molecular Foundry, Lawrence Berkeley National Laboratory
Peer Presentations as a Student-centered Learning Approach in the Nanotechnology Class
Prof. Chang Kyoung Choi, Michigan Technological University
Dr. Nancy B. Barr, Michigan Technological University
Graduate Student Pedagogical Impact Through Development

M330A - Computing and Information Technology Division Technical Session 1
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Computing and Information Technology Division
Moderators: Afsaneh Minaie, Utah Valley University; Xiaojing Yuan, University of Houston, College of Technology (MERGED MEMBERSHIP WITH COE)
This session presents papers on a variety of topics pertaining to computing and information technology.
Deep Learning and Artificial Intelligence: Project Collaboration Across Classes
Prof. Franz J. Kurfess, California Polytechnic State University, San Luis Obispo
Prof. Maria Pantoja, California Polytechnic State University, San Luis Obispo
Dr. Irene Humner, California Polytechnic State University, San Luis Obispo
Leveraging Machine-learning Techniques to Analyze Computing Persistence in Undergraduate Programs
Leila Zahedi, Florida International University
Stephanie J. Lunn, Florida International University
Dr. Samira Pouyanfar, Microsoft
Dr. Monique S. Ross, Florida International University
Dr. Matthew W. Ohland, Purdue University, West Lafayette
Attitude Shifts and Transformation During Computer Science and Delivery of a Collaborative Inquiry-focused High School STEM Program
Dr. Locke Davenport Huyer, University of Toronto
Neal I. Callaghan, University of Toronto
Dr. Dawn M. Kilkenney, University of Toronto
Work in Progress: H-AGEP - A Model to Improve the Preparation and Transition for Hispanic STEM Doctoral Students into Community College Faculty Positions
Prof. Miguel Velez-Reyes P.E., University of Texas at El Paso
Dr. Fenot Aklog, Columbia University
Dr. Dawn M. Horton, University of Massachusetts, Amherst
Dr. Yajaira Mejia, City College of New York
Dr. Ivonne Santiago P.E., University of Texas at El Paso
Prof. Jorge E. Gonzalez, City College of New York
Dr. Jeff Sivils, El Paso Community College
Dr. Harry Meeuwesen, University of Texas at El Paso
Prof. Fred Moshary, City University of New York
Dr. Joseph Barba, City University of New York
and Engineering Student Internships
Dr. Mia Minnes, University of California, San Diego
Dr. Sheena Ghanbari Serslev, University of California, San Diego
Madison Edwards

Partnership to Prepare Students for Careers in the Emerging Field of Cybersecurity
Dr. James K. Nelson Jr. P.E., Texas A&M University
Dr. Brent L. Donham, Texas A&M University-Commerce

M330B - Computing and Information Technology Division Technical Session 2
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Computing and Information Technology Division
Moderators: Muthu Govindaraj, Thomas Jefferson University; Joseph Brobst, Old Dominion University

This session includes papers on a variety of topics pertaining to computing and information technology.

Improving Student Learning and Engagement in Cybersecurity Through Designing and Building Secure Internet of Things (IoT) Systems
Dr. Saeed Al-Haj, Ohio Northern University

Interdisciplinary Cybersecurity Projects Experience: Developing a Market-ready Workforce
Dr. Tamer Omar, California State Polytechnic University, Pomona
Dr. Abdelfattah Aamra, California State Polytechnic University, Pomona
Dr. Kristina Rigden, California State Polytechnic University, Pomona
Dr. Thomas Ketseoglou, California State Polytechnic University, Pomona

Cyber-physical Systems Security Introductory Course for STEM Students
Prof. Sin Ming Loo, Boise State University
Liljana Babinkostova

Cybersecurity Awareness and Training through a Multidisciplinary OSINT Course Project
Alyssa Mendlein, Temple University
Ms. Thuy-Trinh Nguyen, Temple University
Dr. Aunshul Rege, Temple University

M331 - Instrumentation Division Technical Session 1
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Instrumentation Division
Moderators: Akram Hossain, Purdue University Northwest; Ali Alavizadeh, Purdue University Northwest

Embedded Measurement and Control Applications Utilizing Python on the Pocket BeagleBone
Mr. Stephen A. Strom, Pennsylvania State University
Marius Strom, Saint Francis University

Undergraduate Engineering Students Enhance Novel Instrumentation to Detect the Mach Effect
Dr. Peter Mark Jansson, Bucknell University
Mr. Peter Sawirs Kaladius, Bucknell University

Programmable System-on-Chip (PSoC) Usage in Embedded Programming Courses
Prof. David R. Loker, Pennsylvania State University, Erie
Mr. Stephen A. Strom, Pennsylvania State University, Erie

Design and Development of a Sensor/Actuator Module to Enhance Programmable Logic Controller (PLC) Laboratory Activities
Mr. Brad L. Kicklighter P.E., University of Southern Indiana

Repurposing a Nuclear Integrated System Test Facility for Engineering Education
Dr. Hector E. Medina, Liberty University
Jonathan Tristan Polk, Liberty University

Incorporating Visual Components Simulation Software with the Programming Industrial Robots Course
Dr. Maged Mikhail, Purdue University Northwest
Mr. Sandeep Bharti, Purdue University
Dr. Ali Alavizadeh, Purdue University Northwest

M332 - International Division Technical Session 7
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: International Division
Moderators: Phillip Sanger, Purdue University at West Lafayette; Nick Safai, Salt Lake Community College
### M333A - Pre-college Engineering Education Division Technical Session 1

**10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE**

**Sponsor:** Pre-College Engineering Education Division  
**Moderator:** Christina Crawford, Rice University

**A Situative Understanding of the NGSS Science and Engineering Practices**  
Mr. Richard J. Aleong, Purdue University, West Lafayette  
Dr. Robin Adams, Purdue University, West Lafayette

**A Teacher Professional Development Program Using Wireless Communications and NGSS to Enhance STEM Teaching and Learning**  
Mr. Panagiotis Skrimponis, New York University  
Dr. Nikos Makris, University of Thessaly  
Dr. Karen Cheng, Columbia University  
Dr. Jonatan Ostrometzky, Columbia University  
Prof. Zoran Kostic, Columbia University  
Prof. Gil Zussman, Columbia University  
Prof. Thanasis Korakis, New York University  
Dr. Sheila Borges Rajguru, Rutgers - The State University of New Jersey

**Supporting Upper Elementary Students’ Engineering Practices in an Integrated Science and Engineering Unit**  
Miss Sarah Lilly, University of Virginia  
Ms. Anne Marguerite McAlister, University of Virginia  
Dr. Sarah J. Fick, University of Virginia  
Dr. Jennifer L. Chiu, University of Virginia  
Dr. Kevin W. McElhaney, Digital Promise

**Building and Evaluating a Multi-tiered Mentor Program to Introduce Research to High School Women**  
Dr. Katherine C. Chen, Worcester Polytechnic Institute  
Prof. Tiffiny Antionette Butler, Worcester Polytechnic Institute  
Ms. Suzanne Sontgerath, Worcester Polytechnic Institute  
Mrs. Ryan Nicole Meadows, Worcester Polytechnic Institute

**High School Youths’ Workplaces as Sites of Engineering Practices**  
Dr. Amy Wilson-Lopez, Utah State University  
Jorge Americo Acosta Feliz

### M333B - Pre-college Engineering Education Division Technical Session 2

**10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE**

**Sponsor:** Pre-College Engineering Education Division  
**Moderator:** Sandra Nite, Texas A&M University

**Development and Teacher Perceptions of an Avatar-based Performance Task for Elementary Teachers to Practice Post-testing Argumentation Discussions in Engineering Design**  
Pamela S. Lottero-Perdue, Towson University  
Dr. Jamie Mikeska, Educational Testing Service  
Elizabeth Orlandi, Science Education Consultant

**Elementary Students’ Engineering Progress**  
Ms. Elizabeth Ann Moison, Tufts University  
Ms. Karen Miel, Tufts University  
Dr. Merredith D. Portsmore, Tufts University  
Dr. Adam Maltese, Indiana University-Bloomington  
Dr. Jungsun Kim

**Examining Shared Understandings of Design Artifacts in Upper-elementary School Engineering**  
Nicole Alexandra Batrouny, Tufts University  
Dr. Kristen B. Wendell, Tufts University  
Dr. Chelsea Andrews, Tufts University  
Dr. Tejaswini S. Dalvi, University of Massachusetts, Boston

**Gender Differences in Gifted Elementary Students’ Decision-making About Renewable Energy: Social Relationships, Values, and Authority**  
Prof. Younkyeong Nam, Pusan National University  
Dr. Jina Yoon, Pusan National University  
Dr. Jeanna Wieselmann, Southern Methodist University

**Taking a Bandsaw to First Grade: Transforming Elementary School Through Hands-on STEAM Education**  
Ms. Madhurima Das, NuVu Studio
#ASEEVC

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**M333C - Pre-college Engineering Education Division Technical Session 19**

10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE

**Sponsor:** Pre-College Engineering Education Division  
**Moderator:** Martha Cyr, Worcester Polytechnic Institute

**Assessing the Effects of a Robotics Workshop with Draw-a-Robot Test**
- Mr. Abhidipta Mallik, New York University Tandon School of Engineering
- Dr. Pooneh Sabouri, New York University Tandon School of Engineering
- Dr. Shramana Ghosh, New York University Tandon School of Engineering
- Dr. Vikram Kapila, New York University Tandon School of Engineering

**Student Perception of Mathematical Modeling Before and After Completing a Two Joint Robot Computer Simulation Task**
- Mrs. Laurel Johnston, Boise State University
- Dr. Noah Salzman, Boise State University

**The Formation and Dynamics of Teacher Roles in a Teacher-Student Groupwork during a Robotic Project**
- Pooneh Sabouri, New York University
- Dr. Shramana Ghosh, New York University Tandon School of Engineering
- Mr. Abhidipta Mallik, New York University Tandon School of Engineering
- Dr. Vikram Kapila, NYU’s Tandon School of Engineering

**The Nuts and Bolts of Robotics in K-12 Classrooms: A Literature Synthesis**
- Tianshi Fu,
- Dr. Molly H. Goldstein, University of Illinois at Urbana-Champaign
- Prof. Holly M. Goleciki, University of Illinois at Urbana-Champaign

**Using Retrospective Surveys to Assess the Impact of Participating in an Afterschool Maker Learning Program on Youth**
- Dr. Foad Hamidi, University of Maryland, Baltimore County
- Ms. Adena Moulton, Digital Harbor Foundation
- Shawn Grimes
- Stephanie Grimes
- Andrew Coy, Digital Harbor Foundation

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**M333D - Pre-college Engineering Education Division Technical Session 3**

11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE

**Sponsor:** Pre-College Engineering Education Division  
**Moderator:** Vikram Kapila, New York University Tandon School of Engineering

**What is Engineering? A Comparative Case Study of Elementary Students’ Conceptions of Engineering Across STEM and Non-STEM Schools**
- Dr. Jeanna R. Wieselmann, Southern Methodist University
- Dr. Elizabeth A. Ring-Whalen, St. Catherine University
- Dr. Gillian Roehrig, University of Minnesota, Twin Cities

**What Will You Do to Help Elementary Students Who Struggle in the Engineering Design Process? Analysis of Teachers’ Reflections**
- Mr. Zachary Minken, Arcadia University
- Dr. Augusto Z. Macalalag Jr., Arcadia University
- Ms. Najah Naylor

**“Because I’m Not Always Constantly Getting Everything Right”: Gender Differences in Engineering Identity Formation in Elementary Students**
- Ms. Annmarie Elizabeth Hoch, Tufts University
- Ms. Karen Miel, Tufts University
- Dr. Merredith D. Portsmore, Tufts University
- Dr. Rebecca Deborah Swanson, Tufts University

**I Understand Their Frustrations a Little Bit Better”: Elementary Teachers’ Affective Stances in Engineering in an Online Learning Program**
- Dr. Merredith D. Portsmore, Tufts University
- Jessica Watkins, Vanderbilt University
- Dr. Rebecca D. Swanson, Tufts University

**CanSat Pico-satellite Building Workshop as an Effective Tool for STEAM Education, A Case Study**
- Dr. Jorge H. Kurita, Universidad Nacional de Asunción
- Dr. Derlis Ortiz Coronel
- Lucas Domingo Moreira Bogado, Universidad Nacional de Asunción
- Mr. Blas Fernando Vega, Universidad Tecnológica Nacional Universidad de Formación Superior

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M333E - Pre-college Engineering Education Division Technical Session 4

11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Pre-College Engineering Education Division
Moderator: Greg Strimel, Purdue Polytechnic Institute

**A Study of Secondary Teachers’ Perceptions of Engineers and Conceptions of Engineering**

Emel Cevik, Texas A&M University
Dr. Michael Johnson, Texas A&M University
Dr. Bugrahan Yalvac, Texas A&M University
Jennifer Whitfield, Texas A&M University
Dr. Mathew Kuttolamadom, Texas A&M University
Dr. Jay R. Porter, Texas A&M University
Dr. Joseph A. Morgan, Texas A&M University

**Discovery: Differential Student Impact is Evident Within an Inquiry-focused Secondary/Post-secondary Collaborative STEM Program**

Neal I. Callaghan, University of Toronto
Mr. Jose Luis Cadavid, University of Toronto
Mr. Huntley H. Chang, University of Toronto
Ms. Ileana Louise Co, University of Toronto
Mr. Nicolas Ivanov, University of Toronto
Ms. Nhien Tran-Nguyen, University of Toronto
Mr. Jonathan Rubianto, University of Toronto
Dr. Locke Davenport Huyer, University of Toronto
Dr. Dawn M. Kilkenny, University of Toronto

**Professional Development Activities for Secondary STEM Teachers and Students’ Engineering Content Knowledge and Attitudes**

Emel Cevik, Texas A&M University
Dr. Michael Johnson, Texas A&M University
Dr. Bugrahan Yalvac, Texas A&M University
Dr. Jennifer Whitfield, Texas A&M University
Dr. Mathew Kuttolamadom, Texas A&M University
Dr. Jay R. Porter, Texas A&M University
Dr. Joseph A. Morgan, Texas A&M University

**K-12 Digital Skills Programs as Preparation for Engineering Study: A Systematic Literature Review**

Mrs. Katherine Dornian, University of Calgary
Dr. Mohammad Moshipour, University of Calgary
Prof. Laleh Behjat P.Eng., University of Calgary

Kimberly Farnsworth, Arizona State University
Dr. Jean S. Larson, Arizona State University

M334A - Identity, Culture, and Socialization

10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Liberal Education/Engineering & Society Division
Moderator: Juan Lucena, Colorado School of Mines

**Engineering as a Challenging Vocation: How Students Align Personal Values to the Dominant Engineering Discourse**

Dr. Joel Alejandro Mejia, University of San Diego
Dr. Diana Chen, University of San Diego
Prof. Mark A. Chapman, University of San Diego

**Disciplinary Socialization in First-year STEM Students**

Benjamin Goldschneider, Virginia Polytechnic Institute & State University
Dr. Nicole P. Pitterson, Virginia Polytechnic Institute & State University
Dr. Jennifer M. Case, Virginia Polytechnic Institute & State University

**The Modalities of Governance in Engineering Education**

Dr. Atsushi Akera, Rensselaer Polytechnic Institute
Dr. Soheil Fatehboroujeni, Purdue University, West Lafayette
Sarah Appelhans, University at Albany-SUNY
Dr. Alan Cheville, Bucknell University
Dr. Jennifer Karlin, Minnesota State University, Mankato
Dr. Donna M. Riley, Purdue University, West Lafayette
Dr. Thomas A. De Pree, Bucknell University
Rafael Julián Burgos-Mirabal, University of Massachusetts- Amherst

**Defining First-generation and Low-income Students in Engineering: An Exploration**

Dr. Sara A. Atwood, Elizabethtown College
Dr. Shannon Katherine Gilmartin, Stanford University
Dr. Angela Harris, North Carolina State University
Dr. Sheri Sheppard, Stanford University

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**M334B - Minoritization Processes and Critical Responses**
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE

**Sponsor:** Liberal Education/Engineering & Society Division

**Moderators:** Amy Slaton, Drexel University; Justin Hess, Purdue University at West Lafayette

**A Review of the State of LGBTQIA+ Student Research in STEM and Engineering Education**
Madeleine Jennings, Arizona State University
Dr. Rod D. Roscoe, Arizona State University
Dr. Nadia N. Kellam, Arizona State University
Dr. Suren Jayasuriya, Arizona State University

**Campaign Among Engineering Educators**
Dr. Ellen Foster, Purdue University, West Lafayette
Dr. Donna M. Riley, Purdue University, West Lafayette

**Work in Progress: Building a Safe Queer Community in STEM—It Takes a Village to Support a Village**
Dr. Kelly J. Cross, University of Nevada, Reno
Dr. Stephanie Farrell, Rowan University
Dr. Rocío C. Chavela Guerra, American Society for Engineering Education

**M335A - Instructional technologies - Simulations, VR, Remote Education**
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE

**Sponsor:** Manufacturing Division

**Moderator:** Arif Sirinterlikci, Robert Morris University

**Exploring the VR-based PBD Programming Approach to Teach Industrial Robotics in Manufacturing Education**
Dr. Yi-hsiang Isaac Chang, Illinois State University
Dr. Kevin L. Devine, Illinois State University
Mr. Gunnar Keith Klitzing, Illinois State University

**Learning Module of PEM Fuel Cells**
Dr. Irina Nicoleta Ciobanescu Husanu, Drexel University
Kevin Frank, Drexel University
Ms. Ayanna Elise Gardner, Drexel University
Dr. Richard Chiou, Drexel University

**Embedding Computer Simulation-based Classroom Activities to Enhance the Learning Experience for Manufacturing Systems**
Prof. Tzu-Liang Bill Tseng, University of Texas at El Paso
Mr. Md Fashiar Rahman, University of Texas at El Paso

**M335B - Integration of Current Issues into Manufacturing**
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE

**Sponsor:** Manufacturing Division

**Moderator:** Irina Ciobanescu Husanu, Drexel University

**Applying DOE in Performance Optimization of an Automated Position Control System - A Collaborated Case Study between Two Engineering Technology Courses**
Dr. Yuqiu You, Ohio University
Dr. Mustafa Shraim, Ohio University

**Preparing the Future Workforce in Advanced Manufacturing: The Case of South Korea**
Mr. Sang Hoo Oh, Florida State University
Dr. Marcia A. Mardis, Florida A&M University/Florida State University
Dr. Faye R. Jones, Florida State University

**Developing the Industry 4.0 Workforce**
Dr. Arif Sirinterlikci, Robert Morris University

**The Evolution of Teamwork in the Engineering Workplace from the First Industrial Revolution to Industry 4.0: A Literature Review**
Mr. Tahsin Mahmud Chowdhury, Virginia Polytechnic Institute and State University
Dr. Homero Murzi, Virginia Polytechnic Institute and State University

**M336 - Materials Division Technical Session 4**
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE

**Sponsor:** Materials Division

**Moderators:** Kaitlin Tyler, ANSYS; Lessa Grunenfelder, University of Southern California

**Enhancing Undergraduate Research Across Disciplines: Integration of 3-D Printing and Advanced Materials to Engage Students**
Mr. Blake Herren, University of Oklahoma
ASEE’S VIRTUAL CONFERENCE
MONDAY, JUNE 22 SESSIONS

Mr. Ryan Cowdrey
Mr. Weston Scott Sleeper
Colin Bray
Prof. Zahed Siddique, University of Oklahoma
Prof. Yingtao Liu, University of Oklahoma

Promoting Materials Science and Engineering Education Through 3-D Printing Technology
Dr. Tracy Zhang, Michigan State University
Dr. Robert Allen Bubeck, Michigan State University
Miss Therese Aimei Joffre, H. H. Dow High School
Mr. Logan Patrick McNamara, H. H. Dow High School
Aaron Michael Heydenburg
Prof. Bingbing Li, Central Michigan University

Engineering Students’ Comprehension of Phase Diagram Concepts: An International Sample
Mr. Oscar Sanchez-Mata, McGill University
Prof. Mathieu Brochu, McGill University
Prof. Genaro Zavala, Tecnotecno de Monterrey, Mexico and Universidad Andres Bello, Chile

Learning About Diffusion at Two Levels: Agent-based Microscale and Equation-based Macroscale
Jacob Kelter, Northwestern University
Prof. Jonathan Daniel Emery, Northwestern University
Prof. Uri Wilensky, Northwestern University

Demonstration of Shape Memory and Super-elastic Effects of Nitinol Alloys
Dr. Mohamed Samir Hefzy, The University of Toledo
Prof. Mohammad Elahinia, The University of Toledo
Mr. Ahmadi Reza Jahadrakbar, The University of Toledo
Mrs. Bethany Arn, The University of Toledo
Mohammadreza Nematollahi, The University of Toledo

Calculus Readiness and Retention Rates for Home-schooled Students in a Four-year Engineering Program
Dr. Danielle Marie Fredette, Cedarville University

Self-beliefs of Success for College Calculus Students
Prof. Rebecca Ann George, University of Houston
Dr. Weihua Fan, University of Houston
Daijiazi Tang, University of Houston

A Visual and Engaging Approach to Teaching and Learning the Normal Distribution
Dr. Daniel Raviv, Florida Atlantic University
Mr. Daniel Ryan Barb, Florida Atlantic University

M337B - Mathematics Division Technical Session 5: From Functions to Big Data—A Hands-on Challenge
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Mathematics Division
Moderator: Amitabha Ghosh, Rochester Institute of Technology (COE)

Towards Creating Motivationally Supportive Course Structures for Introductory Calculus
Dr. Paran Rebekah Norton, Clemson University
Dr. Karen A. High, Clemson University
William Bridges, Clemson University

Applications of Linear Algebra Applied to Big Data Analytics
Dr. Rajendran Swamidurai, Alabama State University
Dr. Cadavious M. Jones
Dr. Carl Pettis
Dr. Uma Kannan

Qualitative and Quantitative Analysis of University Students’ Ability to Relate Calculus Knowledge to Function Graphs
Dr. Emre Tokgoz, Quinnipiac University
Hasan Alp Tekalp
Mrs. Elif Naz Tekalp
Berrak Seren Tekalp, Quinnipiac University

Turning the Tables on Partial Credit: Computer Aided Exam with Student Reflection for Partial Credit (CAESR4PC)
Dr. Jeffrey Lloyd Hieb, University of Louisville
Dr. Campbell R. Bego, University of Louisville

Schedule subject to change. Please go to www.asee20.pathable.co for up-to-date information
M338A - Mechanical Engineering Technical Session: Fluid Mechanics
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Mechanical Engineering Division
Moderator: Maria-Isabel Carnasciali, University of New Haven
This session will focus on concept maps, learning strategies and simulation in fluids.

Evaluation of Evidence-based Teaching Techniques in a Graduate Fluid Dynamics Course
Dr. John Palmore Jr., Virginia Tech

Integration of CFD and EFD for Experiential Learning in Fluid Mechanics
Dr. Quamrul H. Mazumder, University of Michigan, Flint
Mr. Mohammed Aslam, University of Michigan, Flint
Fardeen Mazumder, University of Michigan, Flint

The Rise of Simulations in a Junior-level Fluid Mechanics Course
Dr. Kamau Wright, University of Hartford
Dr. Ivana Milanovic, University of Hartford
Dr. Tom A. Eppes, University of Hartford

Two Approaches to Concept Maps in Undergraduate Fluid Mechanics
Dr. Julie Mendez, Indiana University-Purdue University Columbus
Dr. Jessica Lofton, University of Evansville

M338B - Mechanical Engineering Technical Session: Assessment and Accreditation: Making the Grade!
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Mechanical Engineering Division
Moderator: Matt Gordon, University of Denver
This technical session will focus on assessment and accreditation, with a special emphasis on the new ABET student outcomes. Papers on the use of bench-marking and concept maps will also be presented.

A Continuous Improvement Model to Enhance Academic Quality in Engineering Programs
Prof. J. Asuncion Zarate-Garcia, Tecnologico de Monterrey
Mrs. Ariadna Serrano-Reyes, Tecnologico de Monterrey
Prof. Miguel X. Rodriguez-Paz, Tecnologico de Monterrey
Prof. Israel Zamora-Hernandez

Changes in ABET Criteria: A Framework for Transition with Greater Fidelity in ArtifactsSupporting Student Performance
Dr. Thomas W. DeNucci, U.S. Coast Guard Academy
Prof. Elizabeth (Elisha) M.H. Garcia, U.S. Coast Guard Academy

A Faculty-directed Continuous Improvement Regimen with Intentional ABET/SO 1-7 Scaffolding
Dr. Vallorie Peridier, Temple University

Multiple-choice Learning Assessments for Intermediate Mechanical Engineering Courses: Insights from Think-aloud Interviews
Dr. Matthew J. Ford, Cornell University
Dr. Hadas Ritz, Cornell University
Dr. Benjamin Finio, Cornell University
Prof. Elizabeth M. Fisher, Cornell University

Using Benchmarking Methods to Inform Curriculum Changes in Mechanical Engineering Programs
Prof. John Whitefoot, University of Pittsburgh
Dr. Mark David Bedillion, Carnegie Mellon University

M339 - Making Mechanics Courses Fun and More Effective
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Mechanics Division
Moderators: Julian Davis, University of Southern Indiana; Vimal Viswanathan, San Jose State University

Classroom Demonstration Module for Two- and Three-dimensional Force Analysis: The Montessori-based Engineering (MBE) Model
Dr. Anuja Kamat, Wentworth Institute of Technology
Hadi Kazemiroodsari, Wentworth Institute of Technology
Prof. Leonard Anderson, Wentworth Institute of Technology

Feel the Force! An Inquiry-based Approach to Teaching Free-body Diagrams for Rigid-body Analysis
Eric Davishahl, Whatcom Community College
Todd Haskell, Western Washington University
Dr. Lee W. Singleton, Whatcom Community College

WIP: Hands-on Engineering Mechanics with a Three-dimensional Laboratory Unit
Dr. Md Rashedul Hasan Sarker, University of Indianapolis
Dr. Najmus Saqib, University of Indianapolis
Dr. George D. Ricco, University of Indianapolis
Megan Hammond, University of Indianapolis
Mr. Jared Hilt
Mr. James T. Emery II, University of Indianapolis

WIP: Hands-on Wednesday (HOW) - An Introduction to
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Statics Experience
Prof. Sarah Wodin-Schwartz, Worcester Polytechnic Institute
Ms. Caitlin A. Keller, Worcester Polytechnic Institute
Dr. Kimberly LeChasseur, Worcester Polytechnic Institute

M339B - Assessment Strategies in Mechanics
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Mechanics Division
Moderators: Carisa Ramming, Oklahoma State University; Amir Yazdi, Rose-Hulman Institute of Technology

- A New Assessment Model, Modified for Use in Dynamics
  Dr. Geoffrey Recktenwald, Michigan State University
  Dr. Tamara Bush, Michigan State University
  Dr. Ron Averill, Michigan State University

- Effects of a New Assessment Model on Female and Underrepresented Minority Students
  Dr. Geoffrey Recktenwald, Michigan State University
  Dr. Michele J. Grimm, Michigan State University
  Dr. Ron Averill, Michigan State University
  Sara Roccabianca, Michigan State University

- Diagnostic Assessments of Student Attitudes and Approaches to Problem Solving in an Engineering Dynamics Course
  Prof. Ning Fang, Utah State University

A Novel Approach to Mastery-based Assessment in Sophomore-level Mechanics Courses
Prof. Keith D. Hjelmstad, Arizona State University
Amie Baisley, University of Florida

M340 - Minorities in Engineering Division Technical Session 1
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Minorities in Engineering Division
Moderator: Trina Fletcher, Florida International University

- Using Social Media to Improve Minority Students’ Skills When Connecting Courses with Different Educational Modalities
  Dr. Mohamed ElZomor, Florida International University
  Mr. Piyush Pradhananga
  Dr. Arif Mohaimin Sadri, Florida International University

- HuskyADAPT: A Project-based Accessible Design Course (Experience)
  Dr. Dianne Grayce Hendricks, University of Washington
  Dr. Anat Caspi P.E., The Taskar Center for Accessible Technology

- Disability and Engineering: A Case of "Othering"?
  Stephanie Lezotte, Rowan University
  Prof. Harriet Hartman, Rowan University
  Dr. Stephanie Farrell, Rowan University
  Mr. Tiago R. Forin, Rowan University

M341 - Multidisciplinary Endeavors: Engineering and Liberal Arts
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Multidisciplinary Engineering Division
Moderators: Yogendra Panta, West Virginia University Institute of Technology; Duncan Davis, Northeastern University

- Fostering Reflective Habits and Skills in Graduate Engineering Education via the Arts and Humanities
  Dr. Ryan C. Campbell, Texas Tech University
  Dr. Danny D. Reible, Texas Tech University
  Dr. Roman Taraban, Texas Tech University
  Dr. Jeong-Hee Kim, Texas Tech University
  Dr. Chongzheng Na, Texas Tech University

- Electrical, Civil, and Mechanical Engineering
  Dr. David Clippinger, Pennsylvania State University
  Dr. Steven Y. Nozaki, Pennsylvania State University
  Dr. Kathleen Jernquist, United States Coast Guard Academy

- Two Student Workshops on Identifying and Resolving Teamwork Conflict
  Dr. Rania Al-Hammoud P.Eng., University of Waterloo
  Ms. Maria Barichello, University of Waterloo
  Mr. Christopher Rennick, University of Waterloo
  Ms. Erin Jobidon, University of Waterloo
  Richard Li, University of Waterloo

- WIP: Integrating Writing Throughout the Engineering Curriculum
  Dr. Denise H. Bauer, Methodist University

- WIP: Introducing Negotiating Skills in Capstone Course
  Katie Loughmiller, Kansas State University

Schedule subject to change. Please go to www.asee20.pathable.co for up-to-date information
M342 - New Engineering Educators 4: Tips and Tools
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: New Engineering Educators Division
Moderators: Kerry Widder, Milwaukee School of Engineering; Derek Briend, Saint Vincent College
Deploying Intelligent Tutoring Systems (ITS) in the Engineering Classroom
Randy Hugh Brooks, Texas A&M University
Measuring Impact: Student and Instructor Experience Using an Online Queue
David Musulman, University of Illinois at Urbana-Champaign
Prof. Karin Jensen, University of Illinois at Urbana-Champaign
Dr. Jennifer R. Amos, University of Illinois at Urbana-Champaign
Prof. Lawrence Angrave, University of Illinois at Urbana-Champaign
Karle Flanagan, University of Illinois at Urbana-Champaign
Prof. Wade Fagen-Ulmschneider, University of Illinois at Urbana-Champaign
Natalia Ozymko, University of Illinois at Urbana-Champaign
Rittika Adhikari, University of Illinois at Urbana-Champaign
Jacqueline Osborn, University of Illinois at Urbana-Champaign
Overcoming Non-numerical Challenges in an Engineering Numerical Methods Course
Dr. Ivan Detchev, University of Calgary
Dr. Elena Rangelova, University of Calgary
Ms. Sheng Lun (Christine) Cao, University of Calgary
Using Course Workbooks as a Classroom Supplement
Dr. Nathan John Washuta P.E., The Citadel
Dr. Robert J. Rabb P.E., The Citadel
Dr. Emily Kate Bierman, The Citadel
Dr. Patrick Bass, The Citadel
Dr. Jason Howison, The Citadel
Dr. James Righter, The Citadel

M345 - Engineering Physics and Physics Division Technical Session 1
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Physics and Physics Division
Moderators: Jessica Conry, Arkansas Tech University; Robert Ross, University of Detroit Mercy
Assessment and Applications of the Conversion of Chemical Energy to Mechanical Energy Using Model Rocket Engines
Dr. Hüseyin Sarper P.E., Old Dominion University
Dr. Nebojsha I. Jaksic, Colorado State University, Pueblo
Dr. Ben J. Stuart, Old Dominion University
Dr. Karina Arcaute, Old Dominion University
Comparison of Labatoriums and Traditional Physics Labs
Prof. Calvin S. Kalman, Concordia University
Mr. Franco La Braca, Concordia University
Dr. Mandana Sobhanzadeh, Mount Royal University
Fostering Inclusion and Teaching Equity in a Modern Physics for Engineers Course
Dr. Jessica R. Hoehn, University of Colorado, Boulder
Prof. Noah D. Finkelstein, University of Colorado, Boulder
Students’ Abilities to Solve RC Circuits with Cognitive Scaffolding Activities
Prof. Genaro Zavala, Tecnologico de Monterrey and Universidad Andres Bello
Prof. Carlos Eduardo Martinez-Torteya, Tecnologico de Monterrey

M346 - Software Engineering Division Technical Session 2
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Software Engineering Division
Moderators: Robert Hasker, Milwaukee School of Engineering; Walter Schilling, Milwaukee School of Engineering
Experiences of Integrating Learning and Engagement Strategies (LEEs) into Software Engineering Courses
Dr. Peter J. Clarke, Florida International University
Dr. Mandayam Thirunarayan, Florida International University
Ms. Sai Chaithra Allala, Florida International University
Juan Pablo Sotomayor, Florida International University
Dr. Monique S. Ross, Florida International University
WIP: Lessons Learned from Applying Standards-based Grading to a Software Verification Course
**M347 - Student Division Technical Session 1**
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Student Division
Moderator: Peter Odom, Purdue University at West Lafayette

How to Use Q Methodology in Engineering Education Research
Ms. Renee Desing, Ohio State University
Dr. Rachel Louis Kajfez, Ohio State University

Paper: Engineering Students’ Perceptions about Female Professors: Insights from the Arabian Gulf
Mr. Safin H. Bayes, Texas A&M University at Qatar
Ms. Jude Aloudeh, Texas A&M University at Qatar
Dr. Aymen Elsheikh, Texas A&M University at Qatar

Critical Educational Theory: Applications in Engineering Education
Ms. Corin L. Bowen, University of Michigan
Dr. Aaron W. Johnson, University of Colorado Boulder

**M348 - Systems Engineering Division Technical Session 1**
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Systems Engineering Division
Moderators: Alice Squires, International Council on Systems Engineering; Bryan Mesmer, The University of Alabama in Huntsville

This virtual session will be a Q&A session with the authors of two papers:

Treadstone: A Process for Improving Modeling Prowess Using Validation Rules
Mr. Michael J. Vinarcik P.E., University of Detroit Mercy

Modelling the Design Systems Thinking Paradigm
Mr. Sabin Gianelloni, University of Illinois at Urbana-Champaign
Dr. Molly H. Goldstein, University of Illinois at Urbana-Champaign

**M349 - Developing Technological Literacy in Students**
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Technological and Engineering Literacy/Philosophy of Engineering Division
Moderator: Carl Hilgarth

In this session, the Technological and Engineering Literacy/Philosophy of Engineering (TELPhE) Division explores issues with developing technological and engineering literacy in students. Methods of developing such skills and student attitudes are explored.

Building Early Elementary Teacher Confidence in Teaching Computer Science Through a Low-Cost, Scalable Research-Practitioner Collaboration
Justin Lee Clough, University of Southern California
Patricia Chaffey, University of Southern California
Gautam Salhotra, University of Southern California
Colin G. Cess, University of Southern California
Rey Pocius, University of Southern California
Dr. Katie Mills, University of Southern California

How Do We "Raise" Ethically Minded Computer Students?
Dr. Elizabeth Milonas, NYC College of Technology - City University of New York

Understanding Better Young People’s Views on Technology in Finland
Dr. Johanna Kristiina Naukkarinen, Lappeenranta-Lahti University of Technology
Dr. Hanna Niemelä, Lappeenranta-Lahti University of Technology LUT

A Perspective on Students’ Autonomy in Learning and Engaging in an Inquiry-based Learning Environment
Neelam Prabhu Gaunkar, Iowa State University
Dr. Mani Mina, Iowa State University of Science and Technology
M350 - 2-Year College Division: Collaboration Between Institutions
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Two-Year College Division
Moderators: Teddy Ivanitzi, American Society for Engineering Education; Dominic Dal Bello, Allan Hancock College

Papers related (but not limited) to collaborations between two or more institutions.

Multi Institutional Collaboration in Additive Manufacturing: Lessons Learned
Michael Littrell, Tennessee Tech University
Dr. George Chitiyo, Tennessee Tech University
Dr. Ismail Fidan, Tennessee Tech University
Ms. Mel Cossette, Edmonds Community College
Mr. Thomas Singer, Sinclair Community College
Ed Tackett, University of Louisville

Evaluating a Multi-Campus Undergraduate Research Program to Improve Retention of 2+2 Engineering Students
Dr. Cynthia Howard-Reed, Pennsylvania State University
Dr. Jennifer X. Wu, Pennsylvania State University
Mrs. Erin A Hostetler, Pennsylvania State University

RELLIS: The Transformational Initiative for Collaborative Education and Research Realized
Dr. James K. Nelson Jr., Texas A&M University System
Ms. Karen Buck, The Blinn College District
Dr. Nancy Shankle Jordan, RELLIS Academic Alliance in The Texas A&M University System
Dr. Mary Hensley, The Blinn College District

Early Career and Remote Undergraduate Research Experiences as Catalysts for More Impactful Community College STEM Opportunities
Dr. Jared Ashcroft, Pasadena City College
Prof. Jillian L Blatti, Pasadena City College
Prof. Marcial Gonzalez, School of Mechanical Engineering, Purdue University
Ms. Melanie T. Hacopian, California State University, Long Beach
Pablo D Zavattieri
Danyal Nicole Pereyda Cave
Mrs. Isabel Bojanini
Mr. Esteban Bautista, California State University, Northridge
Dr. Veronica I. Jaramillo, Pasadena City College

A Collaborative Framework to Advance Student Degree

Completion in STEM
Dr. Ali Zilouchian, Florida Atlantic University
Dr. Nancy Romance, Florida Atlantic University
Michael Vitale
Ms. Annie Laurie Myers
Ms. Dana Hamadeh

M351 - Women in Engineering Division Technical Session 7
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Women in Engineering Division
Moderators: Denise Wilson, University of Washington; Agnes d’Entremont, University of British Columbia, Vancouver

Women, Engagement, Stress, and Worry: Do They Have to Go Hand in Hand?
Dr. Denise Wilson, University of Washington

Approaches in Addressing Access and Success among Female Engineering Students at the 2-year College Level
Dr. Cynthia Lester, Georgia State University
Dr. Sahithya Reddivari, Georgia State University
Ms. Forough Ansari, Georgia State University

Impact of Humanitarianism on Female Student Participation in Engineering
Dr. Adithya Jayakumar, Ohio State University
Dr. Steven Nozaki, Pennsylvania State University, Behrend College

The Gender Bias Dynamic Between Students and Female Faculty in the Engineering Classroom Through Autoethnography
Dr. Eleanor Leung, York College of Pennsylvania
Prof. Inci Ruzybayev, York College of Pennsylvania
Ms. Brandy Maki, Minnesota State University, Mankato

Investigating the Role of Faculty Gender in Mentoring Female Engineering Students for Success
Dr. Kimberly Stillmaker P.E., California State University, Fresno
Dr. Lalita G Oka, California State University, Fresno
Jesus Gutierrez Plascencia
Mrs. Cindy Charlott Schwartz-Doyle, California State University, Fresno
Ms. Katherine Lor, California State University, Fresno

Peer Mentoring for Women in STEM
Prof. Sinéad C. Mac Namara, Syracuse University
Ms. Anne E Rauh, Syracuse University
Dr. Michelle M. Blum, Syracuse University
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Dr. Natalie Russo, Syracuse University
Dr. Melissa A. Green, Syracuse University
Prof. Shikha Nangia, Syracuse University

M352 - Community Engagement Division Technical Session 1
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Community Engagement Division
Moderators: Patrick Sours, The Ohio State University; Ben Bernard, North Dakota State University

Engagement In Practice: Community Engaged Capstone Design Experience
Dr. Rachel Koh, Smith College

Engagement in Practice: Building Community Capacity and Relationships through Rainwater Harvesting Initiatives – Tanzania
Patrick John Sours, Ohio State University
Dr. Michael J. Hagenberger, Ohio State University

Engagement in Practice: Learning Applications of MSE for Design of Community Based Shelter for Housing Insecurity
Dr. Ajay P. Malshe, Purdue University
Dr. Kevin M. Fitzpatrick, University of Arkansas
Dr. Salil Bapat, Purdue University

Engagement in Practice: Practicing Empathy in Engineering for the Community Course
Dr. Malinda S. Zarske, University of Colorado, Boulder
Dr. Michael A. Soltys, University of Colorado, Boulder
Ms. Jennifer Kracha, University of Colorado Boulder

Work in Progress: The Role of Student Counselors at Cybersecurity Summer Camps
Mr. Ben Ralph Bernard, North Dakota State University
Dr. Jeremy Straub, North Dakota State University
Pranay Kumar Marella, Mississippi State University

M357 - Faculty Development Medley!
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Faculty Development Division
Moderators: LOKESH RAMAMOORTHI, University of Miami; Stephanie Cutler, Pennsylvania State University

Come hear about a medley of projects around faculty development!

Determinants of Initial Training for Engineering Educators
Dr. Elizabeth Pluskwik, Minnesota State University, Mankato
Dr. Mani Mina, Iowa State University of Science and Technology

Dr. John Heywood, Trinity College Dublin
Prof. Arnold Neville Pears, Royal Institute of Technology (KTH)

Examining the Needs of Adjunct Faculty in a Distance Education Framework in Higher Education
Dr. Federica Robinson-Bryant, Embry-Riddle Aeronautical University - Worldwide
Dr. Narcrisha Norman, Embry-Riddle Aeronautical University - Worldwide
Dr. Yuetong Lin, Embry-Riddle Aeronautical University - Worldwide

Exploring Literature on How Instructor Feedback Impacts STEM Student Motivation
Cassie Wallwey, Ohio State University
Dr. Rachel Louis Kajfez, Ohio State University

The Five I’s: A Framework for Supporting Early Career Faculty
Dr. Jennifer Karlin, Minnesota State University, Mankato
Dr. Allison Godwin, Purdue University at West Lafayette

M360 - FOCUS ON EXHIBITS: Virtual Showcase
12:00 P.M. - 1:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: ASEE Headquarters

Live interaction with sponsors and exhibitors.

M371A - NSF Grantees: Faculty Development 1
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: NSF Grantees Session
Moderators: Amber Genau, University of Alabama at Birmingham; Emily Allen, California State University, Los Angeles

Presentations from groups with current NSF funding related to faculty development

Reflective Faculty Peer Observation in Engineering
Dr. Heather Dillon, University of Portland
Valerie J. Peterson, University of Portland
Dr. Carolyn McCaffrey James, University of Portland
Prof. Stephanie Anne Salomone, University of Portland
Dr. Tara E. Prestholdt
Dr. Eric Anctil, University of Portland

An Additive Innovation-Based Faculty Development Program: Methods for Case Study Research
Hadi Ali, Arizona State University, Polytechnic campus

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M371B - NSF Grantees: K-12
Session 1
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: NSF Grantees Session
Moderators: Amber Genau, University of Alabama at Birmingham; Karen Gilbert, Virginia Polytechnic Institute and State University

Presentations from groups with current NSF funding related to K-12 education and outreach, including teacher training.

Building Educator Capacity in K-12 Engineering Education
Dr. Elizabeth Cady, National Academy of Engineering
Mr. Greg Pearson, National Academy of Engineering

The First Year of an Undergraduate Service Learning Partnership to Enhance Engineering Education and Elementary Pre-Service Teacher Education
Dr. Stacie I. Ringleb, Old Dominion University
Dr. Jennifer Jill Kidd, Old Dominion University
Dr. Pilar Pazos, Old Dominion University
Dr. Kristie Gutierrez, Old Dominion University
Dr. Orlando M. Ayala, Old Dominion University
Dr. Krishnanand Kaipa, Old Dominion University

Integrating Asset-based Practices, Engineering, and NGSS: Lessons from Working with Teachers through a Community-focused Approach
Dr. Joel Alejandro Mejia, University of San Diego
Dr. Alberto Esquinca, San Diego State University
Dr. Vitaliy Popov, University of San Diego
Melissa M. Arana
Mireya Becker Roberto, University of San Diego
Miss Nicole G. Reyes

Making in the Colonias: Motivating STEM Participation through a Making as Micro-Manufacturing Model
Mr. Osazuwa John Okundaye Jr., Texas A&M University
Dr. Malini Natarajarathinam, Texas A&M University
Dr. Sharon Lynn Chu, University of Florida
Dr. Mathew Kuttolamadom, Texas A&M University
Prof. Francis Quek, Virginia Polytechnic Institute and State University
Alexander Nicholas Berman, Texas A&M University

Using Video Diaries to Explore Perceptions of Engineering: A Comparison of Engineers and Educators
Dr. Rebekah J. Hammack, Montana State University
Dr. Nick Lux, Montana State University
Dr. Paul Gannon, Montana State University
Dr. Brock J. LaMeres, Montana State University

Rohini Abhyankar, Arizona State University
Dr. Samantha Ruth Brunhaver, Arizona State University, Polytechnic campus
Dr. Jennifer M. Bekki, Arizona State University, Polytechnic campus
Dr. Shawn S. Jordan, Arizona State University, Polytechnic campus
Dr. Micah Lande, South Dakota School of Mines and Technology

Scrum as a Change Strategy
Dr. Timothy A. Wilson, Embry-Riddle Aeronautical University - Daytona Beach
Dr. James J. Pembridge, Embry-Riddle Aeronautical University - Daytona Beach
Dr. Massood Towhidnejad, Embry-Riddle Aeronautical University - Daytona Beach
Dr. Erin Elizabeth Bowen, Embry-Riddle Aeronautical University - Prescott
Mr. Carlos Alberto Castro, Embry-Riddle Aeronautical University - Daytona Beach

Developing a Model of Professional Agency Toward Change in Engineering Education for Early Career Scholars
Dr. Courtney June Faber, University of Tennessee at Knoxville
Dr. Walter C. Lee, Virginia Polytechnic Institute and State University
Dr. Alexandra Coso Strong, Florida International University
Dr. Cheryl A. Bodnar, Rowan University
Dr. Courtney S. Smith-Orr, University of North Carolina at Charlotte
Dr. Erin McCave, University of Houston

Community Building for the NSF PFE: RIEF Program Year 1
Prof. Karin Jensen, University of Illinois at Urbana - Champaign
Mr. Joseph F. Mirabelli, University of Illinois at Urbana - Champaign
Dr. Kelly J. Cross, University of Nevada, Reno
Dr. Allyson Jo Barlow, University of Nevada, Reno

Scaling up the SIMPLE Design Model for Faculty Development: Lessons Learned
Prof. Jill K. Nelson, George Mason University
Dr. Margret Hjalmarson, George Mason University
Prof. Anastasia P. Samaras, George Mason University
Dr. Lori C. Bland, College of William and Mary

Schedule subject to change. Please go to www.asee20.pathable.co for up-to-date information
Poverty and Guidance: Challenges and Opportunities in Mathematics Preparation for Engineering

Dr. Eliza Gallagher, Clemson University
Anna Marie Vagnozzi, Clemson University
Mrs. Rachel Lanning, Clemson University
Dr. D. Andrew Brown, Clemson University
Dr. Christy Brown, Clemson University
Dr. Kristin Kelly Frady, Clemson University
Dr. Hope Epps Rivers
Julia Machele Brisbane, Virginia Polytechnic Institute and State University
Dr. Michael A. Matthews P.E., University of South Carolina
Dr. Hossein Haj-Hariri, University of South Carolina
Mr. Joseph Murphy, University of California, Los Angeles
Dr. Khushikumari Patel, Clemson University
Dr. Aubrie Lynn Pfirman, Lander University
Dr. Robert J. Rabb P.E., The Citadel
Mr. Richard H Roberts Jr, Florence Darlington Technical College
Dr. Stanley N. Ihekweazu, South Carolina State University
Prof. Ikhalfani Solan, South Carolina State University
Dr. Ronald W. Welch P.E., The Citadel
Dr. Anand K. Gramopadhye, Clemson University

Jennifer Velez, Arizona State University
Dr. James Collofello, Arizona State University
Dr. Kyle D. Squires, Arizona State University

Learning from Engineers to Develop a Model of Disciplinary Literacy in Engineering (Year 3)

Theresa Green, Utah State University
Dr. Angela Minichiello P.E., Utah State University
Dr. Amy Wilson-Lopez, Utah State University
Dr. Christina Marie Hartman, Utah State University
Jared W. Garlick, Utah State University

Diversifying the Engineering Pipeline through Early Engagement of Neurodiverse Learners

Ms. Constance M. Syharat, University of Connecticut
Dr. Alexandra Hain, University of Connecticut
Dr. Arash E. Zaghi, University of Connecticut

Developing a Research Agenda for the Engineering Ambassador Community

Dr. Stacey V. Freeman, Boston University
Dr. Sandra Lina Rodegher, Boston University

M371D - NSF Grantees: Faculty Development 2

11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: NSF Grantees Session
Moderators: Amber Genau, University of Alabama at Birmingham; Courtney Faber, University of Tennessee at Knoxville

Presentations from groups with current NSF funding related to faculty development

Review and Assessment of an Evidence-Based Professional Development Program to Promote Active-Learning Pedagogical Practices in the Classroom

Dr. Lydia Ross, Arizona State University
Prof. Stephen J. Krause, Arizona State University
Prof. Keith D. Hjelmstad, Arizona State University
Dr. Eugene Judson, Arizona State University
Dr. Lindy Hamilton Mayled, Arizona State University
Prof. James A. Middleton, Arizona State University
Prof. Robert J. Culbertson, Arizona State University
Kara L. Hjelmstad, Arizona State University
Sarah Hoyt, Arizona State University
Dr. Claire Honeycutt
Kristi Glassmeyer, Arizona State University

Reducing Student Resistance to Active Learning: Applying Research Results to Faculty Development

M371C - NSF Grantees: K-12 Session 2

11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: NSF Grantees Session
Moderators: Amber Genau, University of Alabama at Birmingham; Joseph Brobst, Old Dominion University

Presentations from groups with current NSF funding related to K-12 education and outreach

Gaming Spatial-Skill Development: Building STEM Pathways with the Use of the Minecraft Gaming Platform

Dr. Bryce E. Hughes, Montana State University
Dr. Shannon D. Willoughby
Dr. Brock J. LaMeres, Montana State University
Barrett Frank, Montana State University
Mrs. Elaine Marie Westbrook, Montana State University
Dr. Nick Lux, Montana State University

Does EPICS as a Pre-college Program Foster Engineering Identity Development as Correlated to Doing Engineering?

Ciera Ferrone, Arizona State University
Dr. Tirupalavanam G. Ganesh, Arizona State University

Dr. Lydia Ross, Arizona State University
Prof. Stephen J. Krause, Arizona State University
Prof. Keith D. Hjelmstad, Arizona State University
Dr. Eugene Judson, Arizona State University
Dr. Lindy Hamilton Mayled, Arizona State University
Prof. James A. Middleton, Arizona State University
Prof. Robert J. Culbertson, Arizona State University
Kara L. Hjelmstad, Arizona State University
Sarah Hoyt, Arizona State University
Dr. Claire Honeycutt
Kristi Glassmeyer, Arizona State University

Reducing Student Resistance to Active Learning: Applying Research Results to Faculty Development
Lea K. Marlor, University of Michigan
Dr. Cynthia J. Finelli, University of Michigan
Dr. Jenefer Husman, University of Oregon
Madison E. Andrews, University of Texas at Austin
Dr. Maura Borrego, University of Texas at Austin
Laura J. Carroll, University of Michigan
Nicole Marie DeRosia, University of Oregon
Dr. Matthew Charles Graham
Dr. Michael J. Prince, Bucknell University
Ms. Bobbie Bermudez, University of Oregon

Integrating Evidence-based Teaching and Learning Practices into the Core Engineering Curriculum: Student Perceptions of the Instructional Practices
Dr. Gail P. Baxter, Stevens Institute of Technology
Dr. Keith G. Sheppard, Stevens Institute of Technology
Dr. Frank T. Fisher, Stevens Institute of Technology
Dr. Patricia J. Holahan, Stevens Institute of Technology
Dr. Susan Lowes, Teachers College, Columbia University
Ms. Susan S. Metz, Stevens Institute of Technology

What is Valued and Who is Valued for Promotion? Enacting and Sustaining a Policy that Rewards Multiple Forms of Scholarship
Dr. Chrysanthe Demetry, Worcester Polytechnic Institute
Prof. Elizabeth Long Lingo, Worcester Polytechnic Institute
Jeanine Lee McHugh Skorinko, Worcester Polytechnic Institute

Convergent Learning from Divergent Perspectives: An Executive Summary of the Pilot Study
Mrs. Renee Rigrish Pelan, Ohio State University
Tylesha D. Drayton, Ohio State University
Dr. Rachel Louis Kajfez, Ohio State University
Julia Armstrong, Ohio State University

M411 - Joint Panel: Innovating Engineering Education to Transform the Future
1:00 P.M. - 1:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Cooperative and Experiential Education Division
Moderators: Lisa Massi, University of Central Florida; Mary Andrade, University of Louisville
Speakers: Dr. Paul D. Plotkowski, Grand Valley State University; Dr. Sandra English, Cleveland State University; Ms. Robin R. Hammond, Arizona State University

Innovation and Design Centers promise to transform engineering education for a new era of product innovation. In addition to serving as an open and accessible space, aided with visual openness, most centers serve as beacons for creativity and provide a collaborative space for members to meet, design, and create. Such centers host student design teams, design-based courses, and information workshops, and are equipped with modern tools/machines to support these programs. The innovation and design centers intend to focus on the increased importance of design in engineering education, which adds unique value to the engineering degree and makes students highly attractive to employers. Today’s engineering students must not only understand engineering fundamentals; they must be able to use that knowledge to solve problems. Most often, these problems involve the design, construction, testing, and use of engineered systems. In addition to the increased need for design skills, a greater number of researchers seek students who can design and fabricate devices that are needed to investigate engineering questions. Innovation and Design Centers also satisfy a thriving extracurricular activity culture that meets the needs of K-12, secondary, post-secondary, and lifelong learners to meet, design, and build. Workshops may also be conducted to provide technical instruction in 3-D printing, computer coding, and solid modeling, and sponsored lectures by design leaders may target a diverse engineering population, from entry-level engineers to lifelong learners. These centers are aimed at transforming engineering curricula so that students learn the entire innovation-to-product development process. Students will receive instruction in the design process and understand how products must be economically manufactured if they are to be viable in the marketplace and add societal value, The result will be future-ready engineers who understand the modern manufacturing process, with an ability to advance the domestic and worldwide economy, solve societal problems, and improve the quality of life. This is a 30-minute live (synchronous) interactive session. Speakers will give a brief introduction and presentation on the mission, vision, values, and goals of local innovation design centers, followed by an opportunity for attendees to discuss topics of interest in a group setting.

M399 - SPONSOR TECHNICAL SESSION: Using zyBooks to Teach in a Covid- and Post-Covid Environment - Presented by zyBooks
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Sponsord Sessions
Moderator: Nikitha Sambamurthy, Zybooks
Speaker: Nikitha Sambamurthy, Ph.D. zyBooks Engineering Content Lead

Description: The coronavirus pandemic has disrupted education around the world. As higher education institutions grapple with the uncertainty of students returning to campus, many instructors are preparing for courses that can seamlessly transition between in-person and online instruction. This talk presents an overview of zyBooks, which are interactive online engineering textbooks proven to increase student confidence in engineering courses. Throughout the talk, we explore methods to incentivize student reading, assign auto-graded homework and coding labs, and track student learning for engineering courses.
Four electrical and computer engineering (ECE) departments have received grants from the National Science Foundation Revolutionizing Engineering and Computer Science Departments (RED) program since 2015: Colorado State University (2015), Iowa State University (2016), Virginia Tech (2016), and Embry-Riddle Aeronautical University (2019). Each grant is a five-year award with a goal of departmental change and innovation to overcome longstanding issues in undergraduate education and to create more inclusive environments. The focus of RED is on transforming departmental structures and practices and supporting faculty development to improve the middle years experience and the professional formation of engineering students. Overall, NSF has made four rounds of awards for a total of 21 department grantees.

The RED project at CSU has been taking a holistic approach to weave threads on creativity, foundations, and professionalism throughout the curriculum and incorporate knowledge integration activities. At Virginia Tech, there is a new overall program structure designed around base courses and concepts that help students choose subsequent courses that better prepare them for a broader range of careers. The ISU ECE RED project has been developing a collaborative course-desgin model called an "X-team" that helps instructors engage with research-based pedagogy, design thinking, student identity, and professional development. ERAU is implementing agile methods across the department to change the way faculty and students work, and students will use Scrum in projects throughout the middle two years.

Since 2017, the ECE grantees have presented an ECE Division session to share their work and engage the community. Each session has been organized around different themes, including goals, curricula, change processes, professional formation, and stakeholder communication. Given that RED project teams include education and social science researchers who lead efforts to study change at the departmental level, the theme of this session will be on the research studies in each department. The session will focus on the research questions, the motivation and background for the studies, methods used, key findings thus far, and their implications for other ECE departments. Research briefs will be provided. The session will include presentations from each RED ECE department and time for discussion, questions, and interaction to explore implementing and adapting project strategies more widely in other departments.

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The NAE's 2004 report, "The Engineer of 2020: Visions of Engineering in the New Century," presented forward-looking goals for the engineering profession in 2020, including the challenges, opportunities, and global context within which engineers would work. Importantly, the report stated that engineering “must (1) agree on an exciting vision for its future; (2) transform engineering education to help achieve the vision; (3) build a clear image of the new roles for engineers, including as broad-based technology leaders, in the mind of the public and prospective students who can replenish and improve the talent base of an aging engineering workforce; (4) accommodate innovative developments from nonengineering fields; and (5) find ways to focus the energies of the different disciplines of engineering toward common goals.” The report also defined a set of skills and capabilities that would be needed by those future engineers, including both professional and technical skills.
A follow up report in 2005, “Educating the Engineer of 2020: Adapting Engineering Education to the New Century,” recommended several changes to engineering education, including accrediting master’s degree programs for the professional engineering degree, exploring new education models, infusing design activities throughout the undergraduate curriculum, encouraging interdisciplinary learning at the undergraduate level, promoting engineering to the public, and rewarding faculty for conducting engineering education research.

Note: This session initially was planned as a precursor to the Interdivisional Town Hall on looking forward to engineering education in 2030, which was cancelled. We plan to have a full panel in conjunction with next year’s town hall forum.

### M421 - ELD Lightning Talks 1
1:00 P.M. - 1:30 P.M., ONLINE, A VIRTUAL CONFERENCE

**Sponsor:** Engineering Libraries Division  
**Moderators:** Sylvia Jones, Southern Methodist University; Christa Spence, University of Toronto

Attendees will present lightning talks to share research projects and topics in a fun way.

### M425 - Innovative Development for Various Faculty Lines
1:00 P.M. - 1:30 P.M., ONLINE, A VIRTUAL CONFERENCE

**Sponsors:** Environmental Engineering Division; Faculty Development Division  
**Moderators:** Stephanie Cutler, Pennsylvania State University; Azadeh Bahari, University of Colorado Boulder; Fethiye Ozis, Northern Arizona University

Innovative development for tenured/tenure-track faculty and professional faculty (adjunct, non-tenure track, such as teaching and research faculty).

This session is a paper-panel session, where panelists have prepared a paper based on experience/practice/opinion on the topic, but will serve on the panel in lieu of a traditional presentation.

**Working Toward Tenure in a Teaching-focused Branch Campus**

Dr. Shannon L. Isovitsch Parks P.E., University of Pittsburgh at Johnstown

**Examination of Faculty Development in the Departments of Civil & Mechanical Engineering and Geography & Environmental Engineering at the United States Military Academy**

Capt. Jes Barron, U.S. Military Academy  
Lt. Col. Andrew Ross Pfluger, U.S. Military Academy  
Dr. Kathryn K Pegues, United States Military Academy  
Capt. Thomas Bazemore

### M451 - Managing Dual Careers
1:00 P.M. - 1:30 P.M., ONLINE, A VIRTUAL CONFERENCE

**Sponsors:** Women in Engineering Division; Faculty Development Division; Electrical and Computer Division  
**Moderators:** Yuting Chen, University of Illinois at Urbana - Champaign; Jena Asgarpoor, University of Nebraska - Lincoln

**Speakers:** Dr. Janet Callahan, Michigan Technological University; Shannon Bartelt-Hunt P.E., University of Nebraska - Lincoln; Prof. Jill K Nelson, George Mason University; Dr. Lee Kemp Rynearson, Campbell University; Dr. Robyn Sandekian, University of Colorado Boulder

As more and more partners desire to take up academic positions, managing dual careers is a matter that has profound impact, both professionally and personally. Despite the rapid growth in engineering programs across the country, securing even just one faculty position is not an easy feat. When it is a dual-career opportunity, ideally this means securing two positions in the same university, which brings its own level of difficulty and complication. This panel brings speakers with a diverse range of experience and an engaged audience together to discuss managing dual academic careers.

**Managing Dual Academic Careers**

Dr. Yuting W. Chen, University of Illinois Urbana-Champaign  
Dr. Jena Shafai Asgarpoor, University of Nebraska - Lincoln  
Dr. Robyn Sandekian, University of Colorado, Boulder  
Prof. Jill K Nelson, George Mason University  
Dr. Lee Kemp Rynearson, Campbell University  
Shannon Bartelt-Hunt P.E., University of Nebraska - Lincoln  
Dr. Janet Callahan, Michigan Technological University

### M458 - MONDAY Keynote Live Question and Answer
2:00 P.M. - 2:30 P.M., ONLINE, A VIRTUAL CONFERENCE

**Sponsor:** ASEE Board of Directors  
**Moderators:** Stephanie Adams, University of Texas at Dallas; American Society for Engineering Education

**Speaker:** Aldert Kamp

Live question and answer session with TU Delft’s Aldert Kamp, moderated by ASEE President Stephanie Adams.
**M479 - ABET Session: ABET Conducts Remote Program Accreditation Reviews in 2020 - 2021**

1:00 P.M. - 1:30 P.M., ONLINE, A VIRTUAL CONFERENCE

**Sponsor:** ABET Sponsored Sessions  
**Moderator:** Tom Walker  
**Speakers:** Dr. Joseph L Sussman, ABET; Ms. Jane Emmet, ABET

This session will summarize how best to address ABET accreditation within the context of academic program response to the novel coronavirus COVID-19 pandemic. ABET’s Chief Accreditation Officer, Dr. Joe Sussman, and Senior Director of Accreditation Operations, Jane Emmet, will discuss modifications to ABET operations and how these modifications will affect program reviews, acknowledging the current delivery changes to academic programs that have affected teaching and learning.

In addition, Dr. Sussman and Ms. Emmet will answer questions regarding how best to prepare for ABET accreditation given the current status of academic program offerings at institutions around the globe.

This session will summarize recent updates, and we especially encourage participation from programs with ABET visits planned for Fall 2020. Please bring your ABET leaders to this session.

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**M560A - GREET THE STARS AND ASEE 101! New Members Orientation and How to Get Involved with ASEE**

3:30 P.M. - 4:00 P.M., ONLINE, A VIRTUAL CONFERENCE

**Sponsor:** ASEE Headquarters  
**Moderators:** Gary Steffen, Purdue University Fort Wayne; American Society for Engineering Education

GREET THE STARS AND ASEE 101!! New Members Orientation and How to Get Involved with ASEE

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**M560B - COVID-19 Campus Response - Featuring Engineering and Engineering Technology Deans - Presented by the University of Maryland**

2:30 P.M. - 3:30 P.M., ONLINE, A VIRTUAL CONFERENCE

**Sponsor:** ASEE Headquarters  
**Moderator:** Darryll Pines, University of Maryland College Park

COVID-19 Campus Response - Featuring Engineering and Engineering Technology Deans - Presented by the University of Maryland

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**M658 - ASEE Finance Town Hall & General Body Meeting**

4:00 P.M. - 4:30 P.M., ONLINE, A VIRTUAL CONFERENCE

**Sponsor:** ASEE Board of Directors  
**Moderators:** Doug Tougaw, Valparaiso University; Joseph Dillon, ASEE

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**U660 - ASEE DIVISION MIXER Virtual Showcase**

4:30 P.M. - 5:30 P.M., ONLINE, A VIRTUAL CONFERENCE  
**Sponsor:** ASEE Headquarters

Join us in our virtual showcase of ASEE Divisions.
T201 - Student Success, Learning Strategies, and Retention in the Aerospace Industry
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Aerospace Division
Moderators: Mary Johnson, Purdue University at West Lafayette; Michael Hatfield, University of Alaska Fairbanks

An Archival-based Flipped Classroom Implementation for Enhancing the Performance of Academically Struggling Students
Dr. Sharanabasaweshwara Asundi, Old Dominion University

Innovative Learning Strategies to Engage Students Cognitively
Dr. Chadia A. Aji, Tuskegee University
Dr. M. Javed Khan, Tuskegee University
Dr. Ana M. Tameru, Tuskegee University

Tolerance of Ambiguity, Development of Cognitive Models, and Engineering Identity
Dr. M. Javed Khan, Tuskegee University
Dr. Chadia A. Aji, Tuskegee University

Factors that Affect Retention and Satisfaction Among Newly Hired Aerospace Engineers
Lucas Davis, Iowa State University
Dr. Benjamin Ahn, Iowa State University
Ms. Yun Dong, Iowa State University
Mr. Ravonte Nievez Campbell, Virginia Tech

T202 - Architectural Engineering Division Technical Session 3
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsors: Architectural Engineering Division; Construction Engineering Division
Moderator: James Pocock, United States Air Force Academy Summer Scholarship Project: Designing and Building a Multipurpose Micro-farm Structure as a Pedagogical Strategy for Architectural Engineering Technology Students
Mr. Eugene Kwak, Farmingdale State College, State University of New York

The Outer Space Also Needs Architects
Dr. Sudarshan Krishnan, University of Illinois at Urbana-Champaign

Imparting the Values of Energy Simulation Toward Net Zero Plus Status
Dr. Mohamed ElZomor, Florida International University
Prof. Omar Youssef, University of Arizona

Miss Sara Ghaemi, University of Arizona
Mrs. Tasbeeh Alaqtum, University of Arizona

Engaging Students Through Concrete Beam Fabrication
Prof. Christina McCoy, Oklahoma State University
Prof. John J. Phillips, Oklahoma State University

T204 - Intro to Biomedical Engineering and Vertically Integrated Curriculum (Works in Progress) - June 23rd
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Biomedical Engineering Division
Moderators: Conrad Zapanta, Carnegie Mellon University; Ann Saterbak, Duke University

WIP: A Vertically-integrated, Project-focused Approach to Undergraduate Biomedical Engineering Education
Dr. Amber L. Doiron, University of Vermont
Dr. Jason H.T. Bates, University of Vermont
Prof. Ryan S. McGinnis, University of Vermont
Dr. Juan Jose Uriarte, University of Vermont
Niccolo M. Fiorentino, University of Vermont
Dr. Jeff Frolik, University of Vermont
Prof. Rachael A Oldinski

WIP: Student and Faculty Perceptions of Rotating Faculty Facilitators for Introductory Biomedical Engineering Problem-based Learning
Dr. Sara L. Arena, Virginia Polytechnic Institute and State University
Dr. Melissa C. Kenny, Wake Forest University
Dr. Andre Albert Muelenaer, Virginia Polytechnic Institute and State University
Prof. Yong Woo Lee, Virginia Polytechnic Institute and State University
Dr. Pamela Jean VandeVord, Virginia Polytechnic Institute and State University
Dr. Christopher Arena, Virginia Polytechnic Institute and State University

WIP: Incorporating Interactive Modules Related to Cell Culture and Plasmid Design into Introduction to Biomedical Engineering
Dr. Rosalyn Delia Abbott, Carnegie Mellon University
Dr. Conrad M. Zapanta, Carnegie Mellon University
Dr. Michael Cameron Melville, Carnegie Mellon University
Steven Moore, Carnegie Mellon University

WIP: Engaging Early-career Students in Bioengineering with Student-specific Content
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Dr. Erika M. Pliner, University of Pittsburgh
Dr. April Dukes, University of Pittsburgh
Dr. Kurt E. Beschorner, University of Pittsburgh
Dr. Arash Mahboobin, University of Pittsburgh

A Vertically Integrated Design Program Using Peer Education
Dr. Ross Aaron Petrella, University of North Carolina and North Carolina State University Joint Department of Biomedical Engineering
Dr. Hatice O. Ozturk, North Carolina State University at Raleigh
Dr. Lianne Cartee, University of North Carolina and North Carolina State University Joint Department of Biomedical Engineering
Dr. Devin K. Hubbard, University of North Carolina and North Carolina State University Joint Department of Biomedical Engineering
Dr. Kenneth Donnelly, University of North Carolina at Chapel Hill
David A. Zaharoff, University of North Carolina and North Carolina State University Joint Department of Biomedical Engineering
George T. Ligler, University of North Carolina and North Carolina State University Joint Department of Biomedical Engineering

WIP. Building a Learning Continuum: Forging Connections Across a Bioengineering Curriculum for Improved Student Learning
Dr. Sabrina Jedlicka, Lehigh University
Prof. Eugene Thomas Pashuck, Lehigh University
Dr. Susan F. Perry, Lehigh University

T205 - Course Design, Course Projects, and Student Perceptions in Chemical Engineering
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Chemical Engineering Division
Moderators: Anthony Butterfield, University of Utah; LiLu Funkenbusch, University of Florida
Can Students Self-Generate Appropriately Targeted Feedback on Their Own Solutions in a Problem-Solving Context?
Prof. Carl R. F. Lund, University at Buffalo, SUNY
Putting Course Design Principles to Practice: Creation of an Elective on Vaccines and Immunoeengineering
Prof. Joshua A Enszer, University of Delaware
Prof. Catherine A Fromen, University of Delaware
Aligning the Chemical Engineering Curriculum to a Common Problem-solving Strategy
Prof. Nicolas Hudon, Queen's University

Dr. Louise Meunier, Queen's University

How Much Does Student Perception of Course Attributes Impact Student Motivation?
Dr. Margot A Vigeant, Bucknell University
Dr. Amy F. Golightly, Bucknell University

By Students for Students: Using Course Projects to Create Learning Materials for Future Classes
Dr. Lucas James Landherr, Northeastern University

T206 - Key Educational & Professional Issues of Strategic Importance to the Civil Engineering Profession - and ASCE - Part 1
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Civil Engineering Division
Moderators: Thomas Lenox, American Society of Civil Engineers; Leslie Nolen, American Society of Civil Engineers
This session will explore key issues related to the identity and licensure of civil engineers and civil engineering educators.

Licensure Requirements for Teaching Civil Engineering Design Courses in the United States
Dr. Brian J. Swenty, University of Evansville
Dr. Matthew Swenty, Virginia Military Institute

The Engineer of 2020 as of 2020
Dr. Brock E. Barry, U.S. Military Academy
Stephanie Slocum, Engineers Rising LLC

Countering Threats to Licensure with ASCE’s Engineer Tomorrow Initiative
Mr. Bradley Aldrich, American Society of Civil Engineers
Mr. Kenneth H. Rosenfield, American Society of Civil Engineers
Ms. Marlee A. Walton, Iowa State University of Science and Technology
Ms. Jennifer Hofmann, American Society of Civil Engineers

Lessons Learned from the Implementation of Board Certification in the Medical Profession
Dr. Decker B Hains, Western Michigan University
Dr. Stephen J. Ressler, U.S. Military Academy
Dr. Thomas A. Lenox, American Society of Civil Engineers

Schedule subject to change. Please go to www.asee20.pathable.co for up-to-date information
T208 - Computers in Education Division Technical Session 9: Pedagogical Tools
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Computers in Education Division
Moderators: Joe Allen, University of California, Riverside; Alisa Gilmore, University of Nebraska - Lincoln

This session will highlight COED submitted papers that are related to the utilization of specialized pedagogical tools.

Using a Pedagogical Agent to Support Students Learning to Program
Dylan Keifer Finch, Virginia Tech
Prof. Stephen H. Edwards, Virginia Tech

PNW-SLOPE – A New Educational Tool for Geotechnical Engineers
Thiago Fernandes Leao, Purdue University Northwest
Prof. Jiliang Li, Purdue University Northwest
Dr. Jinyuan Zhai, Minnesota State University, Mankato

grupepr, an Open-source Tool for Creating Optimal Student Teams
Dr. Joshua L. Hertz, Northeastern University
Dr. Susan F. Freeman, Northeastern University

GraphVisual: Design and Evaluation of a Web-based Visualization Tool for Teaching and Learning Graph Visualization
Martin Imre, University of Notre Dame
Miss Wenqing Chang, Xi'an Jiaotong University
Miss Shuzhan Wang, Beijing University of Posts and Telecommunications
Dr. Christine P. Trinter, University of Notre Dame
Dr. Chaoli Wang, University of Notre Dame

Use of Computational Tools for Structural Analysis and Design Modification of Automobile Seat-rail Structures under Various Operating Conditions
Prof. Raghur Echempati, Kettering University
Santhosh Sivan Kathiresan, Kettering University

T213A - Maker Spaces in Design Education
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Design in Engineering Education Division
Moderators: Astrid Layton, Texas A&M University; Zahed Siddique, University of Oklahoma

Using a Modularity Analysis to Determine Tool and Student Roles within Maker Spaces
Mr. Colton Daniel Brehm, Texas A&M University
Dr. Julie S. Linsey, Georgia Institute of Technology
Dr. Astrid Layton, Texas A&M University

A Learner- and Equity-Centered Approach to Maker Spaces
Dr. Carolyn Keller, University of Wisconsin, Platteville
Dr. Jodi F. Prosise, University of Wisconsin, Platteville
Dr. Philip J. Parker P.E., University of Wisconsin, Platteville

Interdisciplinary Mini-mester Course on Rapid Prototyping for Product Design
Dr. Amit Shashikant Jariwala, Georgia Institute of Technology
Ms. Jenny Wang, Georgia Institute of Technology
Mr. J. Auston Ferrarer, Georgia Institute of Technology
Ms. Gabrielle E. Lonsberry, Georgia Institute of Technology
Kentez Lanier Craig, Georgia Institute of Technology

Understanding a Maker Space as a Community of Practice
Chieloka Mbaezue, Stanford University
Eric Reynolds Brubaker, Stanford University
Dr. Sheri Sheppard, Stanford University

Application of 3-D CAD and 3-D Printing to RET Program to Enrich Engineering Design Education
Dr. Xinyu Liu, Lamar University
Prof. Xuejun Fan, Lamar University
Prof. Julia Yoo, Lamar University
Dr. Nicholas Andres Brake, Lamar University
Dr. Jiang Zhou, Lamar University
Dr. Xianchang Li, Lamar University
Dr. Dorothy Sisk, Lamar University

Schedule subject to change. Please go to www.asee20.pathable.co for up-to-date information
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T213B - Design Mental Frameworks
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Design in Engineering Education Division
Moderators: Corey Schimpf, The Concord Consortium; Kris Jaeger-Helton, Northeastern University

Reflection in Time: Using Data Visualization to Identify Student Reflection Modes in Design
Dr. Corey T. Schimpf, Concord Consortium
Dr. Molly H. Goldstein, University of Illinois at Urbana-Champaign
Dr. Charles Xie

Engineering Students’ Epistemological Thinking in the Context of Senior Design Projects
Miss Qiushi Li, Shanghai Jiaotong University
Jiabin Zhu, Shanghai Jiao Tong University

Considering People: An Exploratory Investigation of Engineering Student Ideation
Ms. Laura R. Murphy, University of Michigan
Dr. Shanna R. Daly, University of Michigan
Dr. Colleen M. Seifert, University of Michigan
Eytan Adar, University of Michigan
Sophia Brueckner, University of Michigan

Work in Progress: Quantifying Learning by Reflecting on Doing in an Engineering Design, Build, and Test Course
Mrs. Shan Peng, University of Oklahoma
Dr. Zhenjun Ming, University of Oklahoma
Prof. Zahed Siddique, University of Oklahoma
Dr. Janet Katherine Allen, University of Oklahoma
Prof. Farrokh Mistree, University of Oklahoma
Dr. Brian Sanders, Embry-Riddle Aeronautical University
Dr. Mark Douglas Miller, Embry-Riddle Aeronautical University

Communication Tools for Engineering Educators Conducting Class Projects with Dispersed Students
Mr. Michael Roger Straus, North Dakota State University
Mr. Stanley Shie Ng, University of North Dakota

Developing an Instrument to Measure Online Engineering Undergraduate Students’ Learning Experiences and Intentions to Persist
Ms. Eunsil Lee, Arizona State University
Dr. Samantha Ruth Brunhaver, Arizona State University
Dr. Jennifer M. Bekki, Arizona State University

E-learning and Assessment in the Cloud: Engineering Courses
Dr. Stefanos Papanikolaou, West Virginia University

Learner Analytics in Engineering Education: A Detailed Account of Practices Used in the Cleaning and Manipulation of Learning Management System Data from Online Undergraduate Engineering Courses
Mr. Javeed Kittur, Arizona State University
Dr. Jennifer M. Bekki, Arizona State University
Dr. Samantha Ruth Brunhaver, Arizona State University

T214A - Teaching and Learning in Online Environments
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Educational Research and Methods Division
Moderators: Elizabeth Milonas, New York City College of Technology; James Pembridge, Embry-Riddle Aeronautical University - Daytona Beach

Assessment of Learning Effectiveness in Online and Face-to-Face Learning Environment for Engineering Education
Dr. Prabodh Panindre, New York University
Dr. Richard S. Thorsen, New York University

Incorporation of Virtual Learning Environments for Online STEM Activities
Stefan Kleinke, Embry-Riddle Aeronautical University
Dr. Elif Miskioglu, Bucknell University
Dr. Kaela M. Martin, Embry-Riddle Aeronautical University
Dr. Adam R. Carberry, Arizona State University

Communication Expectations to Industry Realities
Dr. Sarah A. Wilson, University of Kentucky
Dr. Renee Kaufmann, University of Kentucky

T214B - Postgraduate Pathways and Experiences
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Educational Research and Methods Division
Moderators: Lizabeth Schlemer, California Polytechnic State University, San Luis Obispo; James Pembridge, Embry-Riddle Aeronautical University - Daytona Beach

Exploring the Early Career Pathways of Degree Holders from Biomedical, Environmental, and Interdisciplinary/Multidisciplinary Engineering
Ms. Jacqueline Rohde, Purdue University, West Lafayette
Jared France, Purdue University, West Lafayette
Ms. Brianna Benedict, Purdue University, West Lafayette
Dr. Allison Godwin, Purdue University, West Lafayette

Work In Progress: Experts’ Perceptions of Engineering Intuition
Dr. Elif Miskioglu, Bucknell University
Dr. Kaela M. Martin, Embry-Riddle Aeronautical University
Dr. Adam R. Carberry, Arizona State University

Communication Expectations to Industry Realities
Dr. Sarah A. Wilson, University of Kentucky
Dr. Renee Kaufmann, University of Kentucky

Schedule subject to change. Please go to www.asee20.pathable.co for up-to-date information
**ASEE’S VIRTUAL CONFERENCE**
**TUESDAY, JUNE 23 SESSIONS**

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**Work in Progress: Novel Ethnographic Approaches for Investigating Engineering Practice**
- Prof. Brent K. Jesiek, Purdue University, West Lafayette
- Dr. Aditya Johri, George Mason University
- Dr. Cory Brozina, Youngstown State University
- Dr. Russell Korte, George Washington University

**Work In Progress: Investigating the Experiences that Develop Competence for Newly Hired Engineers in an Electric Power Company**
- Dr. Russell Korte, George Washington University
- Prof. Saniya LeBlanc, George Washington University

**Imbedding Industry Expectations for Professional Communication into Undergraduate Engineering Curricula**
- Dr. Jacob Allen Cress, University of Dayton
- Dr. Patrick W. Thomas, University of Dayton

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**T215 - Capstone, Undergraduate Research, and Projects in ECE**

**10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE**

**Sponsor: Electrical and Computer Division**

**Moderators: Jennifer Bonniwell, Milwaukee School of Engineering; Huihui Wang, Jacksonville University**

**Crayowulf: A Multidisciplinary Capstone Project**
- Prof. Joel C. Adams, Calvin University
- Mr. Noah Pirrotta, Medallion Instrumentation Systems
- Prof. Mark Michmerhuizen, Calvin University
- Mr. Philip Michael Holmes, Mayo Clinic Graduate School of Biomedical Sciences
- Mr. Peter Oostema, Carnegie Mellon University
- Mr. Benjamin Kastner, Churchill Navigation

**Quality Assurance of Capstone Senior Design Projects: A Case Study**
- Mr. Ahmed Abul Hussain, Prince Mohammad bin Fahd University
- Dr. Nizar Tayem, Texas A&M University
- Dr. Chedly B. Yahya, Prince Mohammad bin Fahd University
- Dr. Sadiq A. Alhuwaidi, Prince Mohammad bin Fahd University
- Prof. Jamal Nayfeh, Prince Mohammad bin Fahd University

**Undergraduate Research: Deep Learning-based Plant Classifiers and Their Real-life Research Applications**
- Dr. Deng Cao, Central State University
- Dr. Cadance Lowell, Central State University
- Dr. Craig M. Schultenhofer, Central State University
- Dr. Augustus Morris, Central State University
- Mr. Austin R. Erdman, Central State University

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**T216 - ECCD - Technical Session 2 - Solar Energy**

**10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE**

**Sponsor: Energy Conversion and Conservation Division**

**Moderators: Ted Song, John Brown University; Robert Kerestes, University of Pittsburgh**

Papers presented in this session are related to Solar Energy and its educational aspects.

**Enlightened Education: Solar Engineering Design to Energize School Facilities**
- Dr. Kenneth A. Walz, Madison Area Technical College
- Mr. Joel B. Shoemaker, Madison Area Technical College
- Steven Michael Ansorge, Madison Area Technical College
- Mr. Adam Gusse, Sunvest Solar, Inc
- Nicholas J. Hylla, Midwest Renewable Energy Association

**Photovoltaic Solar Grill**
- Mrs. Brittany Weber, Renewable Energy Society
- Miss Katelyn Renee Dunnagan, Renewable Energy Society
- Dr. Matthew Aldeman, Illinois State University

**Prototype Automated Solar Tracking with Power Generation System**
- Dr. Saeed Sean Monemi, California State Polytechnic University Pomona

**Mitigation of Solar Photovoltaic Production Variability with Geographical Aggregation**
- Dr. Bennet Thomas Krull, Illinois State University
- Dr. Matthew Aldeman, Illinois State University
- Dr. Jin Ho Jo, Illinois State University

**The Scaled Omni-directional Solar Tracking Unit**
- Dr. Saeed Sean Monemi, California State Polytechnic University Pomona

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Schedule subject to change. Please go to www.asee20.pathable.co for up-to-date information.
T220 - Research on Engineering Ethics Education and Practice
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Ethics Division
Moderator: Alison Kerr, The University of Tulsa

Health Stress and Support System Narratives of Engineering Students
- Dr. Greg Rulifson P.E., U.S. Agency for International Development
- Dr. Angela R. Bielefeldt, University of Colorado Boulder

Mapping Concepts Engineering Students in China Use to Think about Ethics
- Dr. Rockwell Franklin Clancy III, University of Michigan-Shanghai Jiao Tong University Joint Institute
- Dr. Charlemagne Manuel, University of Michigan Shanghai Jiao Tong University Joint Institute
- Dr. Yan Ge, Shanghai Jiao Tong University
- Richard James Clancy, University of Colorado Boulder

Student Perceptions of an Ethics Intervention: Exploration across Three Course Types
- Dr. Madeline Polmear, University of Florida
- Dr. Angela R. Bielefeldt, University of Colorado Boulder
- Dr. Nathan E. Canney, CYS Structural Engineers Inc.
- Dr. Chris Swan, Tufts University
- Dr. Daniel Knight, University of Colorado Boulder

Experiencing Ethical Engineering Practice
- Ms. Dayoung Kim, Purdue University, West Lafayette
- Dr. Justin L. Hess, Purdue University, West Lafayette
- Dr. Nicholas D. Fila, Iowa State University

T221 - Engineering Librarian Collaborations in the Library, on Campus, and Beyond
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Libraries Division
Moderators: Sarah Over, University of Maryland College Park; Margaret Phillips, Purdue University at West Lafayette

No Library, No Problem: Engineering Solutions to Library Challenges
- Cari Lyle, University of Southern California

Hey, You Got Business in My Engineering!: Collaborating to Support Entrepreneurship Research
- Ms. Kelly Giles, James Madison University Libraries
- Ms. Elizabeth Price, James Madison University Libraries

Innovation for the Engaged Librarian
- Ms. Marian G. Armour-Gemmen, West Virginia University

Using Visual Ethnography for Space Studies
- Prof. Pauline Melgoza, Texas A&M University
- Prof. Tina M. Budzise-Weaver, Texas A&M University
- Dr. Sarel Lavy, Texas A&M University
- Miss Tiyamike Kunje

If You Build It, They Will Come: A Case Study of How FSU Libraries Grew Engineering Services Through Targeted Rebranding and Outreach for a Multi-institution College of Engineering
- Denise Amanda Wetzel, Florida A&M University/Florida State University
- Kelly Grove, Florida A&M University/Florida State University

T224 - Novel Strategies for Studying Liberal Education
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Liberal Education/Engineering & Society Division
Moderators: Amy Slaton, Drexel University; Justin Hess, Purdue University at West Lafayette

Engineering Creativity: Ideas from the Visual Arts for Engineering Programs
- Lt. Col. Jakob C. Bruhl, United States Military Academy
- Prof. Win Gilbert Bruhl, University of Arkansas, Little Rock

The Double Bind of Constructionism: A Case Study on the Barriers for Constructionist Learning in Pre-college Engineering Education
- Dr. Michael Lachney, Michigan State University
- Madison C. Allen, Michigan State University
- Briana P. Green, Michigan State University

Using SenseMaker® to Examine Student Experiences in Engineering: A Discussion of the Affordances and Limitations of this Novel Research Approach
- Dr. Nicola W. Sochacka, University of Georgia
- Mr. Christian Michael Culloty, University of Georgia
- Jacob Hopkins
- Mrs. Julie R. Harrell, University of Georgia
- Dr. Joachim Walther, University of Georgia

Work In Progress: A Systematic Review Describing Impacts on Engineering Undergraduates Who Participate in Outreach
- Dr. Joanna K. Garner, Old Dominion University
- Prof. Karen A. Thole, Pennsylvania State University, University Park
- Mr. Michael Alley, Pennsylvania State University, University Park
T238A - Mechanical Engineering Technical Session: Outreach and Retention
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Mechanical Engineering Division
Moderator: Matt Gordon, University of Denver
This session will provide insight and approaches on how to best recruit and retain mechanical engineering students. Outreach activities are also presented.

Enhancing Middle/High School Female Students' Self-confidence and Motivation in Pursuing STEM Careers through Increasing Diversity in Engineering And Labor-force (IDEAL) Outreach Summer Program
Dr. Nina Robson, California State University, Fullerton
Allison Serrano
Mr. Axel Alvarez Loya, California State University, Fullerton
Nikol Miojevic
Kimberly Krystal Lopez-Zepeda
Dr. Madeline E. Rasche

Identifying NSF S-STEM Sponsored Program Activities that Have a Positive Impact on Mechanical Engineering S-STEM Scholars
Dr. Liang Zhu, University of Maryland, Baltimore County
Jamie R. Gurganus, University of Maryland, Baltimore County
Dr. Charles D. Eggleton, University of Maryland, Baltimore County
Dr. Ronghui Ma, University of Maryland, Baltimore County
Prof. Timmie Topoleski, University of Maryland, Baltimore County
Deepa Madan, University of Maryland, Baltimore County

Student Success in Mechanical Engineering: Utilizing Data to Understand Success for Underrepresented Groups
Dr. Molly McVey, University of Kansas
Dr. Carl W. Luchies, University of Kansas
Dr. Sara E. Wilson, University of Kansas
Dr. Lorin P. Maletsy, University of Kansas
Dr. Lin Liu, University of Kansas

The Portia Hypothesis: Mechanical Engineering Student Perceptions of Qualifications
Dr. Leigh S. McCue, George Mason University

T238B - Mechanical Engineering Technical Session: Labs & Projects - New Opportunities
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Mechanical Engineering Division
Moderator: Rungun Nathan, Pennsylvania State University, Berks Campus
This technical session includes various labs and projects developed to improve instruction and student learning.

An Integrated Thermal Science MATLAB® Project
Dr. Tom Eldredge, Liberty University
Dr. John H. Jones, Liberty University

Cantilever Beam Experiment
Dr. Gloria Guohua Ma, Wentworth Institute of Technology
Prof. Siben Dasgupta, Wentworth Institute of Technology
Prof. Anthony William Duva, Wentworth Institute of Technology

Electric Ceiling Hoist: A Semester Project with Competing Forces to Enhance Student Learning in Machine Design
Dr. Dennis O’Connor, California State University, Chico

Foundation Mechatronics Laboratory Course for Mechanical Engineering Students
Dr. Khalifa H. Harib, United Arab Emirates University
Dr. Sangarappillai Sivaloganathan, United Arab Emirates University
Mrs. Rihab Kamal M. Hamza, United Arab Emirates University
Mr. Muthanna Ahmed Aziz, United Arab Emirates University

Structuring a Mechatronics Open Design Project to Reinforce Mechanical Engineering Concepts and Design Skills
Dr. Camilo Ordonez, Florida A&M University/Florida State University
Tomas Fajardo, Florida A&M University/Florida State University
Mr. Shayne Kelly McConomy, Florida A&M University/Florida State University
Mr. Joshua James Blank, Florida A&M University/Florida State University

Schedule subject to change. Please go to www.asee20.pathable.co for up-to-date information
T239 - Concept Inventories in Mechanics
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Mechanics Division
Moderators: Amir Yazdi, Rose-Hulman Institute of Technology; Devin Berg, University of Wisconsin-Stout
Modification of a Physics Rotational Kinematics Concept Inventory for use with Engineering Dynamics Students
Dr. Ann Reimers, University of Virginia
Mr. Stefen Beeler-Duden, University of Virginia
The Dynamics Concept Inventory (DCI) – The Past, Present, and Future
Dr. Phillip Cornwell, Rose-Hulman Institute of Technology
Dr. Brian P. Self, California Polytechnic State University, San Luis Obispo
WIP: Large-scale Development and Deployment of Concept Questions in Statics
Prof. Carisa H. Ramming, Oklahoma State University
Prof. Christopher Papadopoulos, University of Puerto Rico, Mayaguez Campus
Eric Davishahi, Whatcom Community College
Dr. Brian P. Self, California Polytechnic State University, San Luis Obispo
Prof. Sinéad C. MacNamara, Syracuse University
Dr. Meredith Silberstein, Cornell University
Prof. Joan V. Dannenhoffer P.E., Syracuse University
WIP: Implementation of a Dynamics Concept Inventory – Before and After a Dynamics Class
Dr. Julian Ly Davis, University of Southern Indiana
Dr. Sara L. Arena, Virginia Tech
Prof. Mark McKenney, Southern Illinois University, Edwardsville
Matt Johnson
Prof. Sharon Locke
Ms. Ann Vogel, iBIO Institute
Colin Wilson, Southern Illinois University
Dr. Georgia Bracey, Southern Illinois University, Edwardsville
Toward an Understanding of the Effect on Summer Programming on Early Engineering Student Outcomes
Elizabeth A. Sanders, University of Michigan
Dr. Molly H. Goldstein, University of Illinois at Urbana-Champaign
Mrs. Gretchen M. Forman, University of Illinois at Urbana-Champaign

T240 - Minorities in Engineering Division Technical Session 6
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Minorities in Engineering Division
Moderators: Rochelle Williams, Association for Women in Science; Christopher Carr, George Mason University
Developing Meaningful Studies of Student Success with Equity in Mind: Considering Context (Experience Report)
Dr. Sarah Hug, University of Colorado, Boulder
Dr. Wendy Chi, University of Colorado, Boulder
Program for Minority Girls (Research to Practice-Diversity)
Ms. Henriette D. Burns, Southern Illinois University, Edwardsville
Prof. Sinéad C. MacNamara, Syracuse University
Dr. Meredith Silberstein, Cornell University
Prof. Joan V. Dannenhoffer P.E., Syracuse University
Dr. Julian Ly Davis, University of Southern Indiana
Dr. Sara L. Arena, Virginia Tech

T241 - Multidisciplinary Service and Outreach Projects
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Multidisciplinary Engineering Division
Moderators: Lizabeth Schlemer, California Polytechnic State University, San Luis Obispo; Wei Zhan, Texas A&M University
This session highlights programs and projects that combine service and outreach to enhance student learning.
Enhancing Teamwork Skills Through an Engineering Service-learning Collaboration
Dr. Pilar Pazos, Old Dominion University
Mr. Francisco Cima, Old Dominion University
Dr. Jennifer Jill Kidd, Old Dominion University
Dr. Stacie I. Ringleb, Old Dominion University
Dr. Orlando M. Ayala, Old Dominion University
Dr. Kristie Gutierrez, Old Dominion University
Dr. Krishnanand Kaipa, Old Dominion University
Partnering Undergraduate Engineering Students with Preservice Teachers to Design and Teach an Elementary Engineering Lesson Through Ed+gineering
Dr. Kristie Gutierrez, Old Dominion University
Dr. Stacie I. Ringleb, Old Dominion University
Dr. Jennifer Jill Kidd, Old Dominion University
Dr. Orlando M. Ayala, Old Dominion University
Dr. Pilar Pazos, Old Dominion University
Dr. Krishnanand Kaipa, Old Dominion University
Managing an Outreach Consortium for Developing a Pipeline of Skilled Workforce Through Advanced Manufacturing
Dr. Ahmed Cherif Megri, North Carolina A&T State University
Dr. Sameer Hamoush, North Carolina A&T State University

Urban Universities and Community Revitalization Efforts: Opportunities for Student Engagement and Education
Dr. Fouad H. Fouad, University of Alabama at Birmingham
Miss Paula Alvarez Pino
Prof. Andrew J. Sullivan, University of Alabama at Birmingham
Dr. Mona N. Fouad, University of Alabama at Birmingham

WIP: Investigating Student Growth Through a Multidisciplinary Qualifying Project of an Interactive Ball Wall Display to Support Pre-K STEAM Learning at a Community Early Education and Care Center
Ms. Jessica Anne Rosewitz P.E., Worcester Polytechnic Institute
Dr. Katherine C. Chen, Worcester Polytechnic Institute

T247 - Student Division Technical Session 2
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Student Division
Moderator: Alison Kerr, The University of Tulsa

I Graduated, Now What? An Overview of the Academic Engineering Education Research Job Field and Search Process
Dr. Erin J. McCave, University of Houston
Dr. Cheryl A. Bodnar, Rowan University
Dr. Courtney S. Smith-Orr, University of North Carolina at Charlotte
Dr. Alexandra Coso Strong, Florida International University
Dr. Walter C. Lee, Virginia Tech
Dr. Courtney June Faber, University of Tennessee at Knoxville

How to Be a Graduate Student (Before I Forget): A Collection of Experiential Wisdom
Dr. Stephen Secules, Florida International University

Student Perspectives on Navigating Engineering Pathways
Dr. Atsushi Akera, Rensselaer Polytechnic Institute
Dr. Soheil Fatehboroujeni, Purdue University, West Lafayette
Sarah Appelhans, University at Albany-SUNY
Joerene Acerrador Aviles, Rensselaer Polytechnic Institute
Eva Dibong
Beatrice Mendiola, Rensselaer Polytechnic Institute
Ms. Michelle Murray, Rensselaer Polytechnic Institute
Melissa Shuey, Rensselaer Polytechnic Institute
Marta Tsyndra, Rensselaer Polytechnic Institute
Makayla Wahaus, Rensselaer Polytechnic Institute

Switching into and out of Engineering: Trends and Patterns (Work-In-Progress)
Mr. Hossein Ebrahiminejad, Purdue University, West Lafayette
Dr. George D. Ricco, University of Indianapolis
Dr. Matthew W. Ohland, Purdue University, West Lafayette

T248 - Systems Engineering Division Technical Session 2
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Systems Engineering Division
Moderators: Radu Babiceanu, Embry-Riddle Aeronautical University - Daytona Beach; Federica Robinson-Bryant, Embry-Riddle Aeronautical University - Daytona Beach; Bryan Mesmer, The University of Alabama in Huntsville

This virtual session will be a Q and A session with the authors of two papers.

Incorporating Systems Thinking and Systems Engineering Concepts in a Freshman-Level Mechanical Engineering Course
Dr. Karim Heinz Muci-Kuchler, South Dakota School of Mines and Technology
Dr. Cassandra M. Birrenkott, South Dakota School of Mines and Technology
Dr. Mark David Bedillion, Carnegie Mellon University
Dr. Marsha Lovett, Carnegie Mellon University
Dr. Clifford Whitcomb, Naval Postgraduate School

Academic Performance of Engineering Students
Mr. Morteza Nagahi, Mississippi State University
Dr. Raed Jaradat, Mississippi State University
Ms. Samaneh Davarzani, Mississippi State University
Mr. Mohammad Nagahisarchoghaei, University of North Carolina at Charlotte
Dr. Simon R. Goerger, U.S. Army Engineer Research and Development Center

T249 - Exploration of Broad Issues and Promotion of Engineering and Technological Literacy
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Technological and Engineering Literacy/Philosophy of Engineering Division
Moderator: John Krupczak, Hope College

In this session, papers explore the topics of engineering and technological literacy from a broad perspective. Consideration is also given to how to increase such literacy in students, industry, and the public in general.
"Should We Consider Transforming the Definition of Technological and Engineering Literacy..."
Prof. Carl O. Hilgarth

Whither Engineering and Technological Literacy? Cui Bono 2
Prof. John Heywood, Trinity College Dublin

MESA Center Promoting Technical Literacy
Dr. Dan G. Dimitriu, San Antonio College

Engineering R & D
Joseph F. Camean P.E., U.S. Coast Guard Academy

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T250 - 2-Year College Division: Students and the Pipeline
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Two-Year College Division
Moderators: Carl Whitesel, South Mountain Community College; Dominic Dal Bello, Allan Hancock College

Papers related (but not limited) to two-year college students, activities, and pathways.

“It’s Not About Making Money, but it Kind of is About Making Money”: How Socio-economic Status Influences Science and Engineering Identity for Community College Students in an S-STEM Program
- Dr. Sarah Rodriguez
- Mr. Brian Le, Iowa State University
- Maria L. Espino M.A, Iowa State University of Science and Technology

The Motivation of Low-Income Engineering Transfer Students that Influences Choosing and Pursuing a Baccalaureate Degree Attainment in Engineering
- Leo Salgado, University of California, Irvine
- Dr. Sharnnia Artis, University of California, Irvine
- Ms. Hye Rin Lee, University of California, Irvine
- Prof. Lorenzo Valdevit, University of California, Irvine

Women on the Two-year Transfer Pathway in Engineering
- Dr. Emily Knaphus-Soran, University of Washington
- Dr. Roberta Rincon, Society of Women Engineers
- Alexandra Schaefer, University of Washington

Strengthening the Pipeline from High School to Community College to University in Rural Underserved Communities through a Collaborative Videoconferencing Infrastructure
- Dr. Philip J Lunsford II P.E., East Carolina University
- Dr. John Pickard, East Carolina University
- Prof. Jimmy Bill Linn, East Carolina University
- Mrs. Jennifer James, Innovation Early College High School at Pitt County Schools

Transfer Students in Undergraduate Engineering
- Prof. Harriet Hartman, Rowan University
- Stephanie Lezotte, Rowan University
- Dr. Ralph Alan Dusseau P.E., Rowan University
- Mr. Tiago R. Forin, Rowan University
- Dr. Stephanie Farrell, Rowan University

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T252 - Community Engagement Division Technical Session 6
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Community Engagement Division
Moderators: Angela Bielefeldt, University of Colorado Boulder; Joan Schuman, Missouri University of Science and Technology

Assessing Grassroots Engineering Applications in Brazil
- Dr. Cristiano Cordeiro Cruz, Aeronautics Technological Institute

Brazilian Grassroots Engineer's Education: Achievements, Flaws, and Challenges
- Dr. Cristiano Cordeiro Cruz, Aeronautics Technological Institute

Effect of Letter Exchange Program on Student Development, Persistence, and Interest in Civil Engineering
- Dr. Julie Fogarty, California State University, Sacramento
- Dr. Nathan E Canney P.E., CYS Structural Engineers Inc.
- Dr. Benjamin V Fell P.E., California State University, Sacramento

Evaluating the Impact of Training on Increasing Cross Culture Competency
- Dr. Joan B. Schuman, Missouri University of Science and Technology

Undergraduate Students Benefits from Involvement in K-12 Outreach
- Dr. Angela R. Bielefeldt, University of Colorado, Boulder
- Dr. Greg Rulifson P.E., USAID

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T257A - Evidence-based Practices in Faculty Development
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Faculty Development Division
Moderator: Laila Guessous, Oakland University

Ever wonder how faculty developers do what they do? Come learn about some evidence-based practices in faculty development!

Analyzing Student Achievement to Measure the Effectiveness of Active Learning Strategies in the Engineering Classroom
- Sarah Hoyt, Arizona State University
- Dr. Lindy Hamilton Mayled, Arizona State University
- Dr. Eugene Judson, Arizona State University
- Prof. Stephen J. Krause, Arizona State University
Kara L. Hjelmstad, Arizona State University  
Prof. Keith D. Hjelmstad, Arizona State University  
Lydia Ross, Arizona State University  
Prof. Robert J. Culbertson  
Prof. James A. Middleton, Arizona State University  
Dr. Claire Fletcher Honeycutt, Arizona State University  
Ke Liu, Arizona State University  

Faculty Development Mini-modules on Evidence-based Inclusive Teaching and Mentoring Practices in Engineering  
Dr. Sarah Ilkhanipour Rooney, University of Delaware  
Prof. Joshua A. Enszer, University of Delaware  
Dr. Julia A. Maresca, University of Delaware  
Dr. S. Ismat Shah, University of Delaware  
Prof. Sheldon Allister Hewlett, University of Delaware  
Prof. Jenni M. Buckley, University of Delaware  

International Faculty Professional Development: Utilizing Hybrid Environments to Deepen Learning and Grow Community  
Dr. Mary Slowinski, College of the Canyons  
Mrs. Gabrielle P. Temple  
Dr. Kenneth Walz, Madison Area Technical College  

T257B - Faculty Development Research  
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE  
Sponsor: Faculty Development Division  
Moderators: Sunay Palsole, Texas A&M University; Stephanie Cutler, Pennsylvania State University  

What’s new in faculty development research? Come find out!  
Extending Faculty Development through a Sustainable Community of Practice  
Sarah Hoyt, Arizona State University  
Dr. Lindy Hamilton Mayled, Arizona State University  
Prof. Stephen J. Krause, Arizona State University  
Prof. Keight D. Hjelmstad, Arizona State University  
Kara L. Hjelmstad, Arizona State University  
Dr. Claire Fletcher Honeycutt, Arizona State University  
Dr. Eugene Judson, Arizona State University  
Lydia Ross, Arizona State University  
Prof. James A. Middleton, Arizona State University  
Prof. Robert J. Culbertson, Arizona State University  
Ke Liu, Arizona State University  

Improving Automated Group Assignments in an Academic Setting  
Prof. Petra Bonfert-Taylor, Dartmouth College  
Mr. Christopher Miller, Dartmouth College  

Optimizing Student-Faculty Rapport for the Engineering Classrooms: Dimensioning the Behaviors that Matter  
Dr. Fethiye Ozis P.E., Northern Arizona University  
Dr. Kyle Nathan Winfree, Northern Arizona University  

The Role of Teaching Self-Efficacy in Electrical and Computer Engineering Faculty Teaching Satisfaction  
Mr. Kent A. Crick, Iowa State University  
Elise A. Frickey, Iowa State University  
Dr. Lisa M. Larson Ph.D., Iowa State University of Science and Technology  
Prof. Mack Shelley, Iowa State University of Science and Technology  

T271 - NSF Grantees: Diversity 1  
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE  
Sponsor: NSF Grantees Session  
Moderator: Doris Espiritu, Wilbur Wright College- One of the City Colleges of Chicago  

Presentations from groups with current NSF-funded projects focused on understanding and supporting diverse populations within engineering.  
(Mis)match of Students’ Country of Origin and the Impact of Collaborative Learning in Computer Science  
Prof. Nicholas A. Bowman, University of Iowa  
Lindsay Jarratt, University of Iowa  
Dr. KC Culver, University of Southern California  
Dr. Alberto Segre, University of Iowa  

Recruiting More U.S. Women into Engineering Based on Stories from Morocco  
Prof. Rani W. Sullivan, Mississippi State University  
Miss Soundouss Sassi, Mississippi State University  
Dr. Mahnas JeanMohammadi-Aragh, Mississippi State University  

Does Stereotype Threat Affect Creative Thinking in Female Engineering Students? A Behavioral and Neurocognitive Study  
Dr. Rafał Jonczyk, Adam Mickiewicz University, Poland, and Pennsylvania State University  
Ms. Yushuang Liu, Pennsylvania State University  
Dr. Danielle S. Dickson, Pennsylvania State University  
Dr. Gül E. Okudan-Kremer, Iowa State University of Science and Technology  
Prof. Zahed Siddique, University of Oklahoma  
Prof. Janet van Hell, Pennsylvania State University  

Reimagining Energy Year 2: Integrating CSPs into Course Development  
Schedule subject to change. Please go to www.asee20.pathable.co for up-to-date information
Prof. Gordon D. Hoople, University of San Diego
Dr. Joel Alejandro Mejia, University of San Diego
Dr. Diana Chen, University of San Diego
Dr. Susan M. Lord, University of San Diego
Madeline Nelson

Communities Support Engineering as a College Major Choice
Stacey L. Vaziri, Virginia Polytechnic Institute and State University
Dr. Marie C. Paretti, Virginia Polytechnic Institute and State University
Dr. Jacob R. Grohs, Virginia Polytechnic Institute and State University
Dr. Liesl M. Baum, Virginia Polytechnic Institute and State University
Dr. Marlena McGlothlin Lester, Virginia Polytechnic Institute and State University
Dr. Phylis Leary Newbill, Virginia Polytechnic Institute and State University

T271B - NSF Grantees: Diversity 2
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: NSF Grantees Session
Moderator: Teresa Cutright, The University of Akron

Presentations from groups with current NSF-funded projects focused on understanding and supporting diverse populations within engineering, particularly African Americans.

Explaining Choice, Persistence, and Attrition of Black Students in Electrical, Computer, and Mechanical Engineering: Award# EEC-1734347, Grantee Session - Year 2
Dr. Catherine Mobley, Clemson University
Dr. Marisa K. Orr, Clemson University
Dr. Catherine E. Brawner, Research Triangle Educational Consultants
Dr. Rebecca Brent, Education Designs, Inc

Insights from a Systematic Literature Review on the Role of Professional Organizations in Supporting Black Engineering Students’ Persistence
Dr. Jeremi S. London, Virginia Tech
Dr. Brooke Charac Coley, Arizona State University, Polytechnic campus
Julia Machele Brisbane, Virginia Tech
Natali Huggins, Virginia Tech
Ms. Karen Gilbert, Virginia Tech

Initial Impact of an Experiment-centric Teaching Approach in Several STEM Disciplines
Dr. Jumoke ‘Kemi’ Ladeji-Osias, Morgan State University
Dr. Oludare Adegbola Owolabi P.E., Morgan State University
Dr. Krishna Bista, Morgan State University
Dr. Uttam Gaulee
Ayodeji B. Wemida, Morgan State University
Dr. Steve Efe, Morgan State University
Dr. Akinyele Oni, Morgan State University
Dr. Adedayo Aribiyi, Morgan State University
Ms. Caroline Gathigia Ndirangu, Morgan State University
Ms. Emmanuel Olamidotun Olanrewaju, Morgan State University

A Tale of Two Universities: An Intersectional Approach to Examining Microaggressions among Undergraduate Engineering Students at an HBCU and a PWI
Meghan Berger, North Carolina A&T State University
Dr. Stephanie Luster-Teasley, North Carolina A&T State University
Dr. Cristina Poleacovschi, Iowa State University
Dr. Kalynda Chivon Smith, North Carolina A&T State University
Dr. Scott Grant Feinstein
Dr. Gloria Jones-Johnson, Iowa State University
Luis Gonzalez-Diaz

The Inclusive Engineering Consortium Stakeholders’ Workshop
Dr. John C. Kelly, North Carolina A&T State University
Dr. Mohamed F. Chouikha, Prairie View A&M University
Dr. Craig J. Scott, Morgan State University
Dr. Kenneth A. Connor, Rensselaer Polytechnic Institute
Dr. Demetris Geddis, Hampton University
Dr. Mandoye Ndoye, Tuskegee University
Dr. Shiny Abraham, Seattle University
Prof. Miguel Velez-Reyes P.E., University of Texas at El Paso
Dr. Pamela Leigh-Mack, Virginia State University
Dr. Saleh Zein-Sabatto, Tennessee State University
Dr. Raziq Yaqub, Alabama A&M University
T299A - SPONSOR TECHNICAL SESSION: Enabling Virtual Classroom Without Giving Up Hands-on Labs (Or, Save the Disinfectant for the Bathroom, not the Lab) Presented by Analog Devices

10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Sponsored Sessions
Moderators: Mark Thoren, Analog Devices, Inc.; Robin Getz, Analog Devices, Inc.

Colleges and Universities are suddenly faced with the challenge of adapting nearly all classroom instruction to an online, virtual setting. Lectures are difficult enough to run online; hands-on lab exercises are orders of magnitude more so. The Analog Devices University Program is an open-source educational platform consisting of freely available laboratory exercises and accompanying low-cost parts kits and test instruments that can be leveraged as hands-on learning is forced off campus and onto the student’s kitchen table.

In this session, we will demonstrate how to use free software, low-cost test instruments, and common materials in a variety of experiments spanning multiple disciplines including Electrical Engineering, Mechanical Engineering, Computer Science, Embedded Systems (Arduino, Raspberry Pi), and Physics.

We will also share some tricks that Analog Devices engineers have.


10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Sponsored Sessions

Engineering students, faculty and McGraw Hill’s President and CEO discuss how the migration to remote learning has prompted an expedited evolution to their approach. They’ll take on subjects like moving from theoretical knowledge to applied knowledge, and why an online course component is built a certain way.

How do we cover all of this? We break it down into two parts. The first part focuses on approaches and how people are becoming comfortable with what some call, “the new normal.” During the second half watch as a professor explains their why and how to a student as they build a course in McGraw Hill Connect®.

During the Q and A, the McGraw Hill Development Team will address questions about Connect® and SmartBook®2.0 and share a sneak peak of online tools being created to help address:

- Academic integrity
- Evaluating complex problems, not just the final answer
- Writing skills
- Hand-written work evaluation

T301 - Laboratory Courses and Programming in the Aerospace Curriculum

11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Aerospace Division
Moderators: Michael Hatfield, University of Alaska Fairbanks; Nadir Yilmaz, Howard University

The Implementation of Virtual Labs in Aerospace Structures Education

Waterloo Tsutsui, Purdue University at West Lafayette
Mr. Ruben D. Lopez-Parra P.E., Purdue University at West Lafayette
Prof. Genisson Silva Coutinho, Instituto Federal de Educação, Ciência e Tecnologia da Bahia
Dr. Alberto W. Mello, Embry-Riddle Aeronautical University
Prof. Michael David Sangid, Purdue University
Prof. Tamara J. Moore, Purdue University at West Lafayette

Lifelong Learning in an Aircraft Engine Systems Laboratory Course

Prof. Mary E. Johnson Ph.D., Purdue Polytechnic Institute
Dr. Tracy L. Yother, Purdue University - Purdue Polytechnic Lafayette

Establishment of an Aerospace Engineering Laboratory to Foster Education and Research

Dr. Adeel Khalid, Kennesaw State University

Assessment of Programming Prerequisites and Interventions for Student Success in an Aerospace Curriculum

Dr. Kathryn Anne Wingate, University of Colorado at Boulder
Dr. Aaron W. Johnson, University of Colorado Boulder
Miss Lyndsay Rose Ruane
Dennis Akos
T304 - Biomedical Engineers and Professional Development - June 23rd

11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Biomedical Engineering Division

Moderators: Richard Goldberg, University of North Carolina at Chapel Hill; Sarah Rooney, University of Delaware

Understanding Identity among Biomedical Engineering Students and Professionals
  Mr. Emmett Jacob Springer
  Dr. Aileen Huang-Saad, University of Michigan

Clinician-engineer Career Bias and Its Relationship to Engineering Design Self-efficacy among Biomedical Engineering Undergraduates
  Dr. William H. Guilford, University of Virginia

The Value of Co-curricular Experiences: Perspectives of Third-year Biomedical Engineering Students
  Cassandra Sue Ellen Woodcock, University of Michigan
  Dr. Aileen Huang-Saad, University of Michigan
  Dr. Shanna R. Daly, University of Michigan
  Dr. Lisa R. Lattuca, University of Michigan

Spicing Up Instruction of Professional Topics in Biomedical Engineering
  Dr. Jeffrey A. LaMack, Milwaukee School of Engineering
  Dr. Icaro dos Santos, Milwaukee School of Engineering
  Dr. Larry Fennigkoh P.E., Milwaukee School of Engineering
  Dr. Olga Imas, Milwaukee School of Engineering
  Dr. Charles S. Tritt, Milwaukee School of Engineering

Comparison of Job Market and Employer Interest in Undergraduate Engineering Students: An Exploratory Analysis
  Dr. Alexis Ortiz-Rosario, Ohio State University
  Dr. Nathan Hyungsok Choe, Ohio State University
  Amana Shermadou, Ohio State University
  Dr. David A. Delaine, Ohio State University
  Tanya M. Nocera, Ohio State University

T305 - Work in Progress: Assessment, Evaluation and Hands-on Activities

11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Chemical Engineering Division

Moderators: David Silverstein, University of Kentucky; Sheena Reeves, Prairie View A&M University

Work in Progress: The Development and Applied Use of Crash Course Engineering Videos for Formal and Informal Learning
  Dr. Lucas James Landherr, Northeastern University
  Ms. Nicole Joy Sweeney, Complexly

Work in Progress: A Delphi Study of Skills and Competencies for the Hydrocarbon Industry
  Dr. Jennifer Cole, Northwestern University
  Dr. Allison Godwin, Purdue University at West Lafayette
  Ms. Jacqueline Ann Rohde, Purdue University at West Lafayette

Chemical Engineering Students' Emotions towards Biology
  Dr. Justin F. Shaffer, Colorado School of Mines
  Mr. Jordan Lopez, Colorado School of Mines
  Alexander Luther Ellis, Colorado School of Mines

Work in Progress: Fostering a Chemical Engineering Mindset through Hands-on Activities
  Dr. Julianne Vernon, Vanderbilt University
  Mr. Matthew Rogers, Vanderbilt University
  Mr. Benjamin Joseph Saba
  Mr. Yin Huang

T306 - Key Educational & Professional Issues of Strategic Importance to the Civil Engineering Profession - and ASCE - Part 2

10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Civil Engineering Division

Moderators: Thomas Lenox, American Society of Civil Engineers; Leslie Nolen, American Society of Civil Engineers

This session will explore key issues related to the planning of the civil engineering body of knowledge, accreditation, and program assessment.

Criteria 3 and 5 Implementation: How Are People Actually Doing It?
  Dr. Allen C. Estes, California Polytechnic State University, San Luis Obispo
Lessons Learned in Developing the Civil Engineering Body of Knowledge, Third Edition
   Dr. Decker B. Hains P.E., Western Michigan University
   Dr. Kenneth J. Fridley, University of Alabama
   Ms. Leslie Nolen, American Society of Civil Engineers

Toward Continuous Improvement of EAC/ABET Criteria 3 and 5
   Dr. Norb Delatte P.E., Oklahoma State University
   Dr. Stephen J. Ressler P.E., United States Military Academy
   Dr. Audra N. Morse P.E., Michigan Technological University
   Dr. Camilla M. Saviz P.E., University of the Pacific
   Dr. Brock E. Barry P.E., U.S. Military Academy

Is it Time for ASCE to Withdraw from ABET?
   Prof. Stephen J. Ressler, U.S. Military Academy
   Dr. Thomas A. Lenox, American Society of Civil Engineers

T308 - Computers in Education Division Technical Session 3: Digital Learning Part I
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Computers in Education Division
Moderators: Mourya Reddy Narasareddyagari, North Dakota State University; Joe Allen, University of California, Riverside

This session will be one of two sessions dealing with papers related to digital learning.

Integrating Role-playing Gamification into Programming Activities to Increase Student Engagement
   Mr. Zhiyi Li
   Prof. Stephen H. Edwards, Virginia Tech

Work in Progress: Using Jupyter Notebooks to Climb Bloom’s Taxonomy in Thermodynamics
   Prof. Bryan Weber, University of Connecticut

Embedded System Education Curriculum Using TI SimpleLink Microcontrollers in Engineering Technology
   Dr. Byul Hur, Texas A&M University
   Dr. Ana Elisa P. Goulart, Texas A&M University
   Dr. Logan Porter, Texas A&M University
   Dr. Nripendra Sarker, Texas A&M University
   Mr. Mike Willey, Texas A&M University

Infusing Raspberry Pi in the Computer Science Curriculum for Enhanced Learning
   Dr. Fitratullah Khan, University of Texas, Rio Grande Valley
   Dr. Mahmoud K. Quweider, University of Texas, Rio Grande Valley
   Dr. Ala Qubbaj, University of Texas, Rio Grande Valley

Dr. Emmett Tomai, University of Texas, Rio Grande Valley
Lei Xu, University of Texas, Rio Grande Valley
Dr. Liyu Zhang, University of Texas, Rio Grande Valley
Dr. Hansheng Lei

T313A - Best In DEED
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Design in Engineering Education Division
Moderators: Robert Nagel, James Madison University; Jessica Kuczenski, Santa Clara University

3-D Design in Art and Engineering: An Interdisciplinary Experiment
   Dr. Robert T. Bailey P.E., Loyola University Maryland
   Billy Friebele, Loyola University Maryland

Exploring the Influence of Gender Composition and Activity Structure on Engineering Teams’ Ideation Effectiveness
   Mr. Eric Cuellar, California Polytechnic State University, San Luis Obispo
   Dr. Benjamin David Lutz, California Polytechnic State University, San Luis Obispo
   Dominick Trageser
   Dr. Ricardo Cruz-Lozano, California Polytechnic State University, San Luis Obispo

Problem Reframing and Empathy Manifestation in the Innovation Process
   Mrs. Eunhye Kim, Purdue University at West Lafayette
   Dr. Senay Purzer, Purdue University at West Lafayette
   Carolina Vivas-Valencia, Purdue University at West Lafayette
   Dr. Lindsey B. Payne, Purdue University at West Lafayette
   Dr. Nan Kong, Purdue University at West Lafayette

Whom Are We Serving? An Exploration of Student Demographics in a Large Engineering Design Projects Ecosystem
   Prof. David A. Copp, University of California, Irvine
   Ms. Alejandra Hormaza Mejia, University of California, Irvine
   Dr. Mark E. Walter, University of California, Irvine
   Prof. Natascha Trellinger Buswell, University of California, Irvine
**T314A - Sense of Belonging and Diversity in Engineering Programs, Courses, and Teams**

11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE

* Sponsor: Educational Research and Methods Division
* Moderators: Renata Revelo, The University of Illinois at Chicago; James Pembridge, Embry-Riddle Aeronautical University - Daytona Beach

**Work in Progress: Intersection of Race and Gender on Experiences of Undergraduate Engineering Students of Color in Positional Leadership Roles**

Prof. Carmen M. Lilley, University of Illinois at Chicago

**Work in Progress: Cultural Diversity and Teamwork Effectiveness: A Systematized Literature Review**

Mr. Siqing Wei, Purdue University, West Lafayette
Dr. Wei Zakharov, Purdue University, West Lafayette
Dr. Matthew W. Ohland, Purdue University, West Lafayette
Dr. Lan Jin, Purdue University, West Lafayette
Dr. Daniel M. Ferguson, Purdue University, West Lafayette

**Work in Progress: An Exploration of the In/Authentic Experiences of Engineers**

Gretchen A. Dietz, University of Florida
Dr. Elliot P. Douglas, University of Florida
Erica D. McCray, University of Florida

**Work in Progress: Investigating the Impact of Engineering Identity, Belonging, and Career Commitment on Early Postsecondary Outcomes**

Dr. Sandra Marie Way, New Mexico State University
Dr. Stephanie M. Arnett, New Mexico State University
Jeremy J. Brown, New Mexico State University
Miquela K. Gorham
Miss Lorissa Humble, New Mexico State University

**Belonging in Engineering**

Mr. Robert M. O'Hara, Clemson University
Candice Bolding, Clemson University
Dr. Jennifer Harper Ogle, Clemson University
Dr. Lisa Benson, Clemson University
Mrs. Rachel Lanning, Clemson University

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**T314B - Instruments and Methods for Studying Student Experiences and Outcomes**

11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE

* Sponsor: Educational Research and Methods Division
* Moderators: Nadia Kellam, Arizona State University; James Pembridge, Embry-Riddle Aeronautical University - Daytona Beach

**Developing the ESLS - Engineering Students Learning Strategies Instrument**

Dr. Sreyoshi Bhaduri, McGraw-Hill
Dr. Michelle Soledad, Virginia Polytechnic Institute and State University
Dr. Holly M. Matusovich, Virginia Polytechnic Institute and State University

**Examining the Structural Validity of the CD-RISC Among Engineering Students**

Mr. Adurangba Victor Oje, University of Georgia
Dr. Nathaniel Hunsu, University of Georgia
Dr. Peter H. Carnell, University of Georgia

**Blended Phenomenography: An Alternative to Investigate Learning**

Dr. John Mendoza-Garcia, University of Florida
Dr. Monica E. Cardella, Purdue University, West Lafayette
Dr. William "Bill" C. Oakes, Purdue University, West Lafayette

**Exemplars of Integration in Engineering Education’s Use of Mixed Methods Research**

Dr. David Reeping, Virginia Polytechnic Institute and State University
Dr. Cherie D. Edwards, Virginia Commonwealth University

**Streamlining the Process of Evaluating the Education and Diversity Impacts across Engineering Research Centers**

Mr. Zhen Zhao, Arizona State University
Dr. Adam R. Carberry, Arizona State University
Dr. Alison Cook-Davis, Arizona State University
Dr. Jean S. Larson, Arizona State University
Dr. Michelle Jordan, Arizona State University
Wendy M. Barnard, Arizona State University
Dr. Megan O'Donnell, Arizona State University
Dr. Wilhelmina C. Savenye, Arizona State University

**The Use of 3-D Printing in Behavioral Research – A Proposal for the Interaction Between Engineers and Experimental Psychologists**

Dr. Hitesh D. Vora, Oklahoma State University
Dr. Charles Ira Abramson, Oklahoma State University
T315 - Embedded Systems and Cybersecurity in ECE
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Electrical and Computer Division
Moderators: Jennifer Bonniwell, Milwaukee School of Engineering; Huihui Wang, Jacksonville University

Hands-on Cybersecurity Curriculum Using a Modular Training Kit
Mr. Asmit De, Pennsylvania State University
Mr. Mohammad Nasim Imtiaz Khan, Pennsylvania State University
Mr. Karthikeyan Nagarajan, Pennsylvania State University
Mr. Abdullah Ash Saki, Pennsylvania State University
Mahabubul Alam, Pennsylvania State University
Mr. Taylor Steven Wood, Pennsylvania State University
Dr. Matthew Johnson, Pennsylvania State University
Mr. Manoj Varma Saripalli, Pennsylvania State University
Ms. Yu Xia, Pennsylvania State University
Dr. Stephanie Cutler, Pennsylvania State University
Dr. Swaroop Ghosh, Pennsylvania State University
Dr. Kathleen M. Hill, Pennsylvania State University
Dr. Annmarie Ward

Work in Progress: A Case Study in an Undergraduate Security Project
Mr. Garry Ingles
Prof. Aaron Carpenter, Wentworth Institute of Technology

Integration of C Programming and IoT in a Raspberry Pi-controlled Robot Car in a Freshmen/Sophomore Engineering Core Class
Dr. Shaghayegh Abbasi, University of San Diego
Dr. Ernest M. Kim, University of San Diego

A Hands-on Introduction to Embedded Systems & IoT
Dr. James Peyton Jones, Villanova University

Microprocessor Design Learning
Mr. Dominic Zucchini, Missouri University of Science and Technology
Mr. Justin Chau, Missouri University of Science and Technology
Mr. Matthew Neal Mutarelli, Missouri University of Science and Technology and Missouri State University
Dr. Rohit Dua, Missouri University of Science and Technology

T316 - ECCD Technical Session 3: Energy and Multidisciplinary
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Energy Conversion and Conservation Division
Moderators: Matt Aldeman, Illinois State University; Robert Kerestes, University of Pittsburgh

Papers presented in this session are related to energy and multidisciplinary methods and their educational aspects.

Development of a Multidisciplinary Renewable Energy Laboratory for Research and Education
Prof. Jacques Belanger, California Polytechnic State University, San Luis Obispo
Dr. Andrew Davol, California Polytechnic State University, San Luis Obispo
Miss Huy Anh Duong, California Polytechnic State University, San Luis Obispo
Trent Hamilton

A Multidisciplinary Undergraduate Course in Energy Engineering
Dr. Radian G. Belu, Southern University and A&M College
Dr. Fred Lacy, Southern University and A&M College

An Educational Tool to Optimize the Consumption of Primary Energy in Thermal-based Distributed Energy Systems
Dr. Joana Marques Melo, Purdue University, West Lafayette
Dr. Cynthia Howard-Reed, Pennsylvania State University, University Park
Dr. Catherine G.P. Berdanier, Pennsylvania State University, University Park

Experimental Vehicles Program Improves Student Performance Through Energy Conversion and Conservation with Hands-on Learning
Dr. Saeed D. Foroudastan, Middle Tennessee State University

Implementation of the Question Formulation Technique as a Teaching Strategy in Renewable Energy Engineering Education
Dr. Claudia Torres Garibay, Oregon Institute of Technology
Jessica Kerby, Oregon Institute of Technology
Mr. Andrew Powers Minigan, Right Question Institute
T318 - Engineering Design Graphics Division Technical Session 1
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Design Graphics Division
Moderator: Lulu Sun, Embry-Riddle Aeronautical University - Daytona Beach
Advocates on behalf of broadening participation in engineering and engineering technology.
A Simple Method for Allowing Students to Improve Their 3-D Visualization Skills
Dr. Dan G. Dimitriu, San Antonio College
Miss Dana Corrina Dimitriu, University of Texas at San Antonio
Engineering Graphics in a Community College Setting: Challenges and Opportunities
Dr. Hannah Dawes Budinoff, Pima Community College
Longitudinal Analysis of Spatial Ability over an Undergraduate Engineering Degree Program
Dr. Maxine Fontaine, Stevens Institute of Technology
Dr. Alexander John De Rosa, Stevens Institute of Technology

T320 - Assessing Ethics Learning
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Ethics Division
Moderators: Dick Apronti, Angelo State University; Xiaofeng Tang, The Ohio State University
Using Qualitative Data to Further Examine Flagged Items from the Engineering Ethics Reasoning Instrument (EERI)
Peter Wesley Odom, Purdue University, West Lafayette
Assessment of the Impact of Civil Engineering Design Problems for Promoting Ethical Decisions
Dr. Jagadish Torlapati, Rowan University
Dr. Sarah K. Bauer, Rowan University
Prof. Cheng Zhu, Rowan University
Measuring Curriculum Effectiveness for Developing Principled Leaders in an Undergraduate Engineering Program
Dr. David S. Greenburg, The Citadel
Dr. Robert J. Rabb P.E., The Citadel
Variations in Reflections as a Method for Teaching and Assessment of Engineering Ethics
Dr. Angela R. Bielefeldt, University of Colorado, Boulder
Dr. Madeline Polmear, University of Florida
Dr. Chris Swan, Tufts University
Dr. Daniel Knight, University of Colorado Boulder
Dr. Nathan E. Canney

T323A - Capstone/ET Projects III - Mechanical and Manufacturing Focus
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Technology Division
Moderator: Mohammad Uddin, East Tennessee State University
Actively Engaging Project-based Learning Through a Mini Maker Faire in an Engineering Technology Program
Dr. Wei Zhan, Texas A&M University
Dr. Byul Hur, Texas A&M University
Dr. Yonghui Wang, Prairie View A&M University
Dr. Suxia Cui, Prairie View A&M University
Dr. Bugrahan Yalvac, Texas A&M University
Adoption of Additive Manufacturing Certifications and Metal Additive Manufacturing by Technology Programs
Dr. Ranjeet Agarwala, East Carolina University
Dr. Robert A. Chin, East Carolina University
Design a Class Infusion Project of ASME Geometric Dimensioning and Tolerancing Standard
Dr. Cheng Y. Lin P.E., Old Dominion University
Dr. Hamid Eisazadeh, Old Dominion University
Dr. Alok K. Verma P.E., Old Dominion University
Mr. Nathan John Luetke, Old Dominion University
Rapid Manufacturing of Critical Industrial Parts: A Method Based on Reverse Engineering, Rapid Prototyping, and Coordinate Metrology
Dr. Immanuel Edinbarough P.E., University of Texas Rio Grande Valley
Dr. Aditya Akundi, University of Texas Rio Grande Valley
Warehouse Workforce Preparedness in the Wake of Industry 4.0: A Systematic Literature Review
Dr. Lei Xie, Texas State University
Dr. Malini Natarajarathinam, Texas A&M University
Dr. Michael Johnson, Texas A&M University
ASEE’S VIRTUAL CONFERENCE
TUESDAY, JUNE 23 SESSIONS
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T323B - Capstone/ET Projects II - General
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Technology Division
Moderator: John Irwin, Michigan Technological University
This session features capstone projects and/or general projects related to engineering technology education.

A Multi-major Senior Design Experience
Dr. Avimanyu Sahoo, Oklahoma State University
Dr. Aaron Alexander, Oklahoma State University
Dr. Jeeyeon Hahn, Oklahoma State University

Designed Beam Deflections Lab Project
Dr. Wei Vian, Purdue University, West Lafayette
Prof. Nancy L. Denton P.E., Purdue University, West Lafayette

Industrial Wire Cutting Machine: A Senior Capstone Design Project
Dr. Austin B. Asgill P.E., Kennesaw State University
Mr. Jorge Luis Portillo Rodriguez
Rebeca Feregrino Rodriguez, Kennesaw State University

Leveraging the Capstone Design Project to Foster Entrepreneurship and Address Real-world Problems
Dr. Austin B. Asgill P.E., Kennesaw State University

Student Learning Outcomes Through Senior Capstone Experience
Prof. Adel Salama P.E., Austin Peay State University
Dr. Chin-Zue Chen, Austin Peay State University

T324 - ENT Division Technical Session: Creativity and Innovation
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Entrepreneurship & Engineering Innovation Division
Moderators: Nassif Rayess, University of Detroit Mercy; Jason Forsyth, James Madison University

Analyzing Innovative Behavior Outcomes of Early-career Engineering Graduates
Mr. Simon Jakob Barth, Stanford University
Dr. Sheri Sheppard, Stanford University
Dr. Shannon Katherine Gilmartin, Stanford University

Challenge Me, Disagree with Me: Why Gendered Perceptions to Student Stories of Motivation Enhance Creative Approaches in Engineering
Prof. Mona Eskandari, University of California, Riverside
Dr. Ville Mikael Taajamaa, City of Espoo
Dr. Barbara A. Karanian, Stanford University

Delivering K-12 Invention and Entrepreneurship to Rural Areas: Programming, Teacher Experiences, and Student Outcomes in a Partner Hub
Dr. Sunni Haag Newton, Georgia Institute of Technology
Dr. Roxanne A. Moore, Georgia Institute of Technology
Dr. Meltem Alemdar, Georgia Institute of Technology
Mr. Timothy Cone, Center for Education Integrating Science, Mathematics and Computing

Educating Future Engineers: Student Perceptions of the Societal Linkages of Innovation Opportunities
Dr. Sine Celik, Aalto University
Ms. Senni Kirjavainen, Aalto University
Dr. Tua A. Björklund, Aalto University Design Factory

Integrating Innovation Curriculum: Measuring Student Innovation to Assess Course and Program Effectiveness
Dr. Karl D. Schubert, University of Arkansas
Kristie Neff Moergen, University of Arkansas
Dr. Carol S. Gattis, University of Arkansas
Dr. Wen-Juo Lo, University of Arkansas

Work in Progress: Using Neuro-responses to Understand Creativity, the Engineering Design Process, and Concept Generation
Tess Hartog, University of Oklahoma
Megan Marshall, University of Oklahoma
Mr. Amin G. Alhashim, University of Oklahoma
Md Tanvir Ahad, University of Oklahoma
Prof. Zahed Siddique, University of Oklahoma

T325 - A Focus on Sustainability
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Environmental Engineering Division
Moderators: Denise Wilson, University of Washington; Drew McAvoy, University of Cincinnati; David Sanchez, University of Pittsburgh

Work in Progress: An Exploratory Study of the Sustainability Mindset Through a Citizen Science Project in a Vulnerable Latinx Community
Dr. Azadeh Bolhari P.E., Angelo State University
Dr. Daniel Ivan Castaneda, James Madison University
Dr. Kenneth Stewart, Angelo State University

Study of the Impact of the University on Sustainability in Far West Texas
Mr. Anand Raj, University of Texas at El Paso
Dr. Peter Golding, University of Texas at El Paso

Schedule subject to change. Please go to www.asee20.pathable.co for up-to-date information.
TUESDAY, JUNE 23 SESSIONS

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ASEE'S VIRTUAL CONFERENCE

TUESDAY, JUNE 23 SESSIONS

Dr. Diane Elisa Golding, University of Texas at El Paso
Dr. Scott A. Starks, University of Texas at El Paso
Dr. Luis Perez, University of Texas at El Paso
Dr. Luis Rene Contreras Sapien, University of Texas at El Paso
Mrs. Suzan Aranda Luna, University of Texas at El Paso

Mixed Method Approach to Evaluate Sustainability Thinking Among the Next Generation of Civil and Environmental Engineers

Dr. Fethiye Ozis P.E., Northern Arizona University
Ms. Nihal Sarikaya, Northern Arizona University
Prof. Roy St. Laurent, Northern Arizona University
Miss Daniel’Le April DeVoss, Northern Arizona University

Environmental Sustainability and Electronics: High School Teacher Development Through Summer Research Experiences

Dr. Inez Hua, Purdue University, West Lafayette
Dr. Monica E. Cardella, Purdue University, West Lafayette

Mrs. Michael G. Patterson, University of Pennsylvania
Carolyne H. Godon, University of Pennsylvania
Dr. LeAnn Dourte Segan, University of Pennsylvania
Sevile Mannickarottu, University of Pennsylvania

PLC Training in a First-year Electrical Engineering Program

Dr. Cyrus Habibi P.E., University of Wisconsin, Platteville
Darius Fieschko, University of Wisconsin, Platteville

Work in Progress: A Modular Course on Sensors, Instrumentation, and Measurement: Supporting a Diversity of Learners’ Agency of Self-direction

Dr. Brian D. Storey, Franklin W. Olin College of Engineering
Dr. Bradley A. Minch, Franklin W. Olin College of Engineering
Dr. Linda Vanasupa, Franklin W. Olin College of Engineering

T326 - Experimentation and Laboratory-oriented Studies Division Technical Session 2

11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Experimentation and Laboratory-Oriented Studies Division

Moderators: Harry Powell, University of Virginia; Sean Maw, University of Saskatchewan

Student Participation in Formula SAE Design, Fabrication, and Testing as Capstone Experience

Joshua Pierson, University of Georgia
Dr. John M. Mativo, University of Georgia
Edwin Chiuz, University of Georgia
Dr. Mark Trudgen, University of Georgia
Dr. Christopher Herring, University of Georgia

Developing a Virtual Reality Module to Improve the Student Learning Experience in an Additive Manufacturing Curriculum

Prof. Jing Zhang, Indiana University Purdue University, Indianapolis
Mr. Glorio Singui
Mr. Shambhuraj Hansraj Wadhule
Mr. Chauncey Eugene Frend
Mr. Tejesh Charles Dube, Indiana University Purdue University, Indianapolis
Mr. Michael Golub, Indiana University Purdue University, Indianapolis

Under the Hood of a Bio-makerspace: Automating Lab Operations

Mr. Michael G. Patterson, University of Pennsylvania
Carolyne H. Godon, University of Pennsylvania
Dr. LeAnn Dourte Segan, University of Pennsylvania
Sevile Mannickarottu, University of Pennsylvania

T327A - First-year Programs: Retention and Bridge Programs #1

10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: First-Year Programs Division

Moderators: Kaitlin Mallouk, Rowan University; Rachel McCord, University of Tennessee at Knoxville

Improving Persistence and Success for At-risk STEM Students Through a Summer Intervention Program at a Hispanic-serving Institution

Dr. Melissa Danforth, California State University, Bakersfield
Dr. Charles Lam, California State University, Bakersfield
Dr. Ronald Hughes, California State University, Bakersfield

Work in Progress: Impacting Engineering First-year Student Retention Through a Nonconventional Engineering Learning Community

Dr. Sonia M. Bartolomei-Suarez, University of Puerto Rico, Mayaguez Campus
Dr. Manuel A. Jimenez, University of Puerto Rico, Mayaguez Campus
Dr. Luisa Guillemand, University of Puerto Rico, Mayaguez Campus
Prof. Oscar Marcelo Suarez, University of Puerto Rico, Mayaguez Campus
Dr. Aidsa I. Santiago-Román, University of Puerto Rico, Mayaguez Campus
Dr. Nayda G. Santiago, University of Puerto Rico, Mayaguez Campus
Dr. Carla Lopez del Puerto, University of Puerto Rico, Mayaguez Campus
Dr. Pedro O. Quintero, University of Puerto Rico, Mayaguez Campus
Prof. Nelson Cardona-Martinez, University of Puerto Rico,
T327B - First-Year Programs: Student Perceptions and Perspectives
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: First-Year Programs Division
Moderators: Robin Hensel, West Virginia University; Mirna Mattjik, Colorado School of Mines

Learn about first-year students' perceptions and perspectives.
Student Perceptions of First-year Engineering Justice Curriculum
Dr. Devin R. Berg, University of Wisconsin-Stout
Dr. Tina Lee, University of Wisconsin-Stout
Dr. Elizabeth Anne Buchanan, University of Wisconsin-Stout

Critical Learning Community in a First-year Engineering

T327C - First-Year Programs: Retention & Bridge Programs #2
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: First-Year Programs Division
Moderators: Robert Schaffer, Mission College; Marina Miletic

Learn about successful retention and bridge programs.
Is High School GPA a Useful Tool for Identifying At-risk Students in First-Year Engineering?
Dr. Aysa Galbraith, University of Arkansas
Mrs. Leslie Bartsch Massey, University of Arkansas

Work in Progress: The RISE Seminar and the Influence it Has on Underrepresented Students in STEM
Dr. Ellise M. LaMotte, Tufts University

Learning Communities: Impact on Retention of First-year Students
Dr. Maryam Darbeheshti, University of Colorado Denver
William Schupbach, University of Colorado Denver
Ariel Cervantes LaFuente
Prof. Tom Altman, University of Colorado Denver
Prof. Katherine Goodman, University of Colorado Denver
Dr. Michael S. Jacobson, University of Colorado Denver
Shani O'Brien, University of Colorado Denver

Assessing a Summer Engineering Math and Projects
ASEE’S VIRTUAL CONFERENCE
TUESDAY, JUNE 23 SESSIONS

Bootcamp to Improve Retention and Graduation Rates in Engineering and Computer Science
Dr. Zahrasadat Alavi, California State University, Chico
Dr. Kathleen Meehan, California State University, Chico
Dr. Kevin Buffardi, California State University, Chico
Dr. Webster R. Johnson, California State University, Chico
Dr. Joseph Greene, California State University, Chico

Integrated Closed-Loop Learning Analytics Scheme in a First-Year Engineering Course
Dr. Andrew Charles Bartolini, University of Notre Dame
Mr. Carson Lee Running, University of Notre Dame
Xiaojing Duan, University of Notre Dame
Dr. G. Alex Ambrose, University of Notre Dame

T328A - Preparation for Graduate Research
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Graduate Studies Division
Moderators: Charles Pierce, University of South Carolina; Jeffrey Fergus, Auburn University

Design Activity Worksheets for Developing Research Questions
Dr. Vetria Byrd, Purdue University, West Lafayette
Dr. Jorge D. Camba, Purdue University, West Lafayette

Work in Progress: A Problem-based Curriculum in Support of Structured Learning Experiences to Prepare Ph.D. Candidates for Independent Research
Dr. Stephanie Cutler, Pennsylvania State University
Ms. Yu Xia, Pennsylvania State University
Dr. Cliff J. Lissenden, Pennsylvania State University
Prof. Francesco Costanzo, Pennsylvania State University
Dr. Bruce Gluckman, Pennsylvania State University
Dr. Thomas A. Litzinger, Pennsylvania State University

Development of a Graduate Cybersecurity Research Methods Course
Dr. Jeremy Straub, North Dakota State University

Assessing Engineering Ph.D. Students’ Research Experiences: What is Important to Assess?
Mr. Eric Holloway, Purdue University, West Lafayette
Prof. David F. Radcliffe, Purdue University, West Lafayette
Dr. Kerrie A. Douglas, Purdue University, West Lafayette
Dr. William "Bill" C. Oakes, Purdue University, West Lafayette

T328B - Mental Health of Graduate Students
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Graduate Studies Division
Moderators: Yogendra Panta, West Virginia University Institute of Technology; Jeffrey Fergus, Auburn University

Graduate Studies Division Technical Session
Examining the Effects of STEM Climate on the Mental Health of Graduate Women from Diverse Racial/Ethnic Backgrounds
Ms. Amanda C. Arnold, Arizona State University
Dr. Kerrie G. Wilkins-Yel, University of Massachusetts Boston
Dr. Jennifer M. Bekki, Arizona State University
Madison Natarajan, University of Massachusetts Boston
Dr. Ashley K. Randall, Arizona State University
Roxanna Francies, Arizona State University
Chinwendum Elyse Okwu, University of Pittsburgh

Validation of an Instrument to Measure Science, Engineering, and Mathematics Graduate Students’ Mental Health (Work in Progress)
Ms. Sarah Jane Bork, University of Michigan
Dr. Joi-Lynn Mondisa, University of Michigan

Developing and Sustaining a Research Group: A Novel Approach to Onboarding Doctoral Students
Dr. Madeline Polmear, University of Florida
Dr. Denise Rutledge Simmons P.E., University of Florida

T330A - Computing and Information Technology Division Technical Session 9
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Computing and Information Technology Division
Moderators: Stephen Edwards, Virginia Polytechnic Institute and State University; Zhaoshuo Jiang, San Francisco State University

This session includes papers on a variety of topics pertaining to computing and information technology.

From Degree to Chief Information Security Officer (CISO): A Framework for Consideration
Dr. Wendi M. Kappers, Embry-Riddle Aeronautical University, Daytona Beach
Dr. Martha Nanette Harrell, Arkansas Tech University

I-Tracker: Warranty Tracking

Schedule subject to change. Please go to www.asee20.pathable.co for up-to-date information
T330B - Computing and Information Technology Division Technical Session 3
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Computing and Information Technology Division
Moderators: Elizabeth Milonas, New York City College of Technology; Qingxue Zhang, Indiana University - Purdue University Indianapolis

This session includes papers on a variety of topics pertaining to computing and information technology.

**Incorporating Practical Computing Skills into a Supplemental CS2 Problem-solving Course**
- Prof. Margaret Ellis, Virginia Tech
- Dr. Catherine T. Amelink, Virginia Tech
- Prof. Stephen H. Edwards, Virginia Tech
- Dr. Clifford A. Shaffer, Virginia Tech

**Undergraduate Summer Research in High-performance Computing with Engineering Applications: An Experience Report**
- Dr. Daqing Hou, Clarkson University
- Dr. Yu Liu, Clarkson University

**An Initial Look into the Computer Science and Cybersecurity Pathways Project for Career and Technical Education Curricula**
- Dr. Vukica M. Jovanovic, Old Dominion University
- Dr. Murat Kuzu, Old Dominion University
- Dr. Otilia Popescu, Old Dominion University
- Mr. Abdul Rahman Badawi, Old Dominion University
- Deborah Kay Marshall, Norfolk Public Schools
- Salih Sarp, Old Dominion University
- Mrs. Spyridoula Tsouganatou, Old Dominion University
- Dr. Petros J. Katsioloudis, Old Dominion University

**Dr. Linda Vahala, Old Dominion University**
Prof. Hongyi Michael Wu, Old Dominion University

**Evaluating the Effectiveness of Lab Practice in the Context of Prior Programming Experience in an Introductory Programming Course**
- Caleb James O'Malley, University of Florida
- Ashish Aggarwal, University of Florida

T333A - Pre-college Engineering Education Division Technical Session 16
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Pre-College Engineering Education Division
Moderator: Foad Hamidi, University of Maryland Baltimore County

**Implementation of a Spatial Skills Curriculum in Grade 7: Analysis of the Teachers’ Concerns**
- Ms. Camille Msall, Northwestern University
- Dr. Grace Panther, University of Nebraska, Lincoln

**New Mexico PREP Academy from 2016-2019**
- Jacqueline A. Zeiber, New Mexico State University
- Prof. Tamara Elise Stimatze, New Mexico State University
- Dr. Patricia A. Sullivan, New Mexico State University
- Dr. Steven J. Stochaj, New Mexico State University
- Prof. Luis Antonio Vázquez

**Preparing High School Students to Succeed in STEM Fields via an Early College Experience**
- Dr. Kathryn Schulte Grahame, Northeastern University
- Dr. Christos Zahopoulos, Northeastern University
- Ms. Rajini Jesudason, Northeastern University

**Reinventing the InVenture Prize: Transforming a Year-long Invention Program into a Week-long University-based Summer Program**
- Ms. Katherine Leigh Boice, Georgia Institute of Technology
- Mr. Christopher J. Cappelli, Georgia Institute of Technology
- Dr. Meltem Alemdar, Georgia Institute of Technology
- Ms. Jasmine N. Patel, Georgia Institute of Technology
- Dr. Roxanne A. Moore, Georgia Institute of Technology

**The Effect of Summer Engineering Camps on Students’ Interest in STEM**
- Ms. Jessica Marie Faber, Wartburg College
- Luke G. Grzech, Wartburg College
- Murad Musa Mahmoud, Wartburg College
- Prof. Kurt Henry Becker, Utah State University
T333B - Pre-college Engineering Education Division Technical Session 17
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Pre-College Engineering Education Division
Moderator: Pamela Lottero-Perdue, Towson University

Kindergartners’ Engagement in an Epistemic Practice of Engineering: Persisting and Learning from Failure
Pamela S. Lottero-Perdue, Towson University
Dr. Ming Tomayko, Towson University

Development of Views About the Nature of Engineering Knowledge Questionnaire
Allison Antink-Meyer, Illinois State University
Dr. Ryan A. Brown, Illinois State University

Coordinated Outreach: A Model of STEAM Outreach Efforts
Wendy Roldan, University of Washington
Ms. Taryn Shalini Bipat, University of Washington
Jessica Carr, University of Washington
Elena Agapie, University of Washington
Andrew Davidson, University of Washington
Dr. Jennifer A. Turns, University of Washington

Empathy, Engineering, and Girls
Dr. Deborah Besser P.E., University of St. Thomas
Ms. Karin Brown, University of St. Thomas
Ms. Alison Haugh, University of St. Thomas
Mrs. Tami Brass, University of St. Thomas and St. Paul Academy and Summit School
Rebecca Ann Leininger, University of St. Thomas
Dr. AnnMarie Thomas, University of St. Thomas

Role of Engagement in Predicting Sixth-grade Students’ Performance in an Integrated STEM Life Sciences Unit
Saira Anwar, Purdue University, West Lafayette
Dr. Muhsin Menekse, Purdue University, West Lafayette
Siddika Selcen Guzey, Purdue University, West Lafayette
Ms. Valarie L. Bogan, Purdue University, West Lafayette
Mrs. Marla Jane Glover, Purdue University, West Lafayette
Shelbi C. Smeathers, Purdue University, West Lafayette
Utkuhan Genc, Purdue University, West Lafayette
Prof. Lynn A. Bryan, Purdue University, West Lafayette

T333C - Pre-college Engineering Education Division Technical Session 18
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Pre-College Engineering Education Division
Moderator: Katherine Shirey

Using Nintendo Switch Development Environment to Teach Computer Game Programming and Virtual Reality
Dr. Arif Sirinterlikci, Robert Morris University
Dr. John M. Mativo, University of Georgia
Mr. Johnny Thien Pham, Robert Morris University

Authentic Learning Environment with Flight Simulation Technology
Dr. Chadia A. Aji, Tuskegee University
Dr. M. Javed Khan, Tuskegee University

Work in Progress: Code + Chords: Targeting Self-efficacy in Music Technology
Alyssa Marie Eggersgluss, Playful Learning Lab
Dr. AnnMarie Thomas, University of St. Thomas
Dr. Deborah Besser P.E., University of St. Thomas
Rachel Farah, University of St. Thomas
Mr. Cullen Charles Kittams, Playful Learning Lab
Ms. Emma Michelle Monson, University of St. Thomas
Ms. Krista Schumacher, University of St. Thomas
Dr. Jeff Jalkio, University of St. Thomas

Using Music Videos to Inspire Engineering
Ms. Krista Schumacher, University of St. Thomas
Molly Roche, University of St. Thomas
Esmée Julia Verschoor, Playful Learning Lab
Hannah French
Alyssa Marie Eggersgluss, Playful Learning Lab
MiKyla Jean Harjamaki, Playful Learning Lab
Mary Fagot
Dr. Deborah Besser P.E., University of St. Thomas
Dr. Jeff Jalkio, University of St. Thomas
Dr. AnnMarie Thomas, University of St. Thomas
Mr. Collin John Goldbach, Playful Learning Lab
Mr. Damian Kulash
Abby Bensen, University of St. Thomas
T334A - Technical Courses and Liberal Education
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Liberal Education/Engineering & Society Division
Moderator: Judith Norback, Georgia Institute of Technology

An Emancipatory Teaching Practice in a Technical Course: A Layered Account of Designing Circuits Laboratory Instructions for a Diversity of Learners
Dr. Linda Vanasupa, Franklin W. Olin College of Engineering
Dr. Lizabeth T. Schlemer, California Polytechnic State University, San Luis Obispo
Dr. Yevgeniya V. Zastavker, Franklin W. Olin College of Engineering

Designing an Engineering Computer Instructional Laboratory: Working with the Panopticon
Dr. Shehla Arif, University of Mount Union

The Challenge of Preparing iGen Students for Engineering and Computer Science
Dr. Kenneth W. Van Treuren, Baylor University
Dr. William M. Jordan, Baylor University
Ms. Cynthia C. Fry, Baylor University

WIP: Reflection to Promote Development of Presentation Skills in a Technical Communication Course
Dr. Dianne Grayce Hendricks, University of Washington
Mary-Colleen Jenkins
Ms. Tina Loucks-Jaret

Work in Progress: A Qualitative Study of Mentorship, Training Needs, and Community for New Engineering Education Researchers
Mr. Joseph F. Mirabelli, University of Illinois at Urbana-Champaign
Ms. Allyson Jo Barlow, University of Nevada, Reno
Ms. Mia Ko, University of Illinois at Urbana-Champaign
Dr. Kelly J. Cross, University of Nevada, Reno
Prof. Karin Jensen, University of Illinois at Urbana-Champaign

T334B - Creating a Supportive and Nurturing Academic Culture
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Liberal Education/Engineering & Society Division
Moderator: Kathryn Neeley, University of Virginia

Contemplative Practices as a Way of Creating Inclusive Environments in Engineering Education: A Story of One Physics Foundation Experience for Engineers
Dr. Madhvi Jayalakshmi Venkatesh, Harvard Medical School; Prakriti Dance; Franklin W. Olin College of Engineering
Dr. Yevgeniya V. Zastavker, Franklin W. Olin College of Engineering
Eleanor Berke, Boston Public Schools
Jimena Bermejo
David Freeman, Franklin W. Olin College of Engineering
Ms. Abigail M. Fry
Alex L. Hindelang

Work in Progress: Identifying Factors that Impact Student Experience of Engineering Stress Culture
Mr. Joseph Francis Mirabelli, University of Illinois at Urbana-Champaign
Andrea J. Kunze, University of Illinois at Urbana-Champaign
Ms. Julianna Ge, Purdue University, West Lafayette
Dr. Kelly J. Cross, University of Nevada, Reno
Prof. Karin Jensen, University of Illinois at Urbana-Champaign

T335 - Green Energy Manufacturing and Sustainable Energy Management
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsors: Manufacturing Division; Energy Conversion and Conservation Division
Moderator: Tzu-Liang Tseng, University of Texas at El Paso

Project-based Learning with Implementation of Virtual Reality for Green Energy Manufacturing Education
Dr. Richard Chiou, Drexel University
Toshika Fegade, Drexel University
Ms. Yu-Chieh (Jamie) Wu, Drexel University
Prof. Tzu-Liang Bill Tseng, University of Texas at El Paso
Dr. Michael G. Mauk, Drexel University
Dr. Irina Nicoleta Ciobanescu Husanu, Drexel University

Dr. Jung-Uk Lim, Liberty University
Dr. Kyung K. Bae, Liberty University
Dr. Hector E. Medina, Liberty University
T336 - Materials Division
Technical Session 1
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Materials Division

Moderators: Amber Genau, University of Alabama at Birmingham; Lessa Grunenfelder, University of Southern California

A Significant Learning Approach for Materials Education
Dr. Sayyad Zahid Qamar P.E., Sultan Qaboos University
Dr. Majid Al-Maharbi, Sultan Qaboos University
Mr. Josiah Cherian Chekotu, Dublin City University

Enhancing Student Appreciation for Materials Science: Integration of Domain-specific Project-based Learning in an Introductory Materials Science Course
Dr. Siddha Pimputkar, Lehigh University
Dr. Gregory Mark Skutches, Lehigh University
Dr. Sabrina Starr Jedlicka, Lehigh University

Enhancing Instruction by Uncovering Instructor Blind Spots from Muddiest Point Reflections in Introductory Materials Classes
Prof. Stephen J. Krause, Arizona State University
Sarah Hoyt, Arizona State University

Use of a Low-cost, Open-source Universal Mechanical Testing Machine in an Introductory Materials Science Course
Miss Xinyue (Crystal) Liu, University of Toronto
Mr. Simo Pajovic, Massachusetts Institute of Technology
Mr. Cheuk Yin Larry Kei, University of Toronto
Dr. Yasaman Delaviz, York University
Dr. Scott D. Ramsay, University of Toronto

WIP: Integration of Mechanical Properties of Materials in an Undergraduate Course on Manufacturing Processes for Both Mechanical and Industrial Engineering Students
Dr. Jayanta K. Banerjee, University of Puerto Rico, Mayaguez Campus

T337 - Mathematics Division
Technical Session 1: Best Practices in Engineering Math Education
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Mathematics Division

Moderator: Amitabha Ghosh, Rochester Institute of Technology (COE)

Exposing Undergraduate Engineering Students to Nonlinear Differential Equations Using a Practical Approach in Project-based Learning Environments
Dr. Günter Bischof, Joanneum University of Applied Sciences
Mr. Maximilian Brauchart, Joanneum University of Applied Sciences
Mr. Patrick Jenni, Joanneum University of Applied Sciences
Mr. Jeremias Pirker, Joanneum University of Applied Sciences
Mr. Julian Sachslehner, Joanneum University of Applied Sciences
Mr. Christian J. Steinmann, Joanneum University of Applied Sciences
Mr. Tobias Markus Zörweg, Joanneum University of Applied Sciences

Lessons from a Lower-division Mathematics Co-teaching Sequence
Dr. Charles Lam, California State University, Bakersfield
Dr. Melissa Danforth, California State University, Bakersfield
Dr. Ronald Hughes, California State University, Bakersfield

The Use of Computer Programming in a Secondary Mathematics Class
JaCoya Thompson, Northwestern University
Dr. Sally P.W. Wu, Northwestern University
Mr. Jacob Mills, Evanston Township High School

Elements of Good Problem-solving Tasks in Thinking Classrooms
Mr. Nathaniel Rossi, Arizona State University
Dr. Adam R. Carberry, Arizona State University
Dr. Scott Adamson, Chandler-Gilbert Community College
T338A - Mechanical Engineering Technical Session: The Art of Education
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Mechanical Engineering Division
Moderator: Thomas DeNucci, United States Coast Guard Academy

This technical session focuses on mechanical engineering as an educational program. Papers on course sequencing, writing in the discipline, and student well-being will be presented.

A Three-course Laboratory Sequence in Mechanical Engineering as a Framework for Writing in the Discipline
Dr. Maria-Isabel Carnasciali, University of New Haven
Dr. Eric A. Dieckman, University of New Haven
Dr. Ismail I. Orabi, University of New Haven
Dr. Samuel D. Daniels P.E., University of New Haven

A Total Quality Management Tool for Experiential Engineering Education
Dr. Nicholas DiZinno, New York University
Ms. Yona Jean-Pierre, New York University

Engineering Project Development Through a Sequence of Courses
Dr. Nelson Fumo, University of Texas at Tyler

Finding Balance: Examining the Impact of Grades on Engineering Students’ Well-being
Dr. Eleazar Marquez, Rice University
Dr. Samuel Garcia Jr., Texas State University

Impact of Nanoscale Science and Engineering Course on Undergraduate Engineering Education
Dr. Ozgul Yasar-Inceoglu, California State University, Chico

T338B - Mechanical Engineering Technical Session: Team/Project-based Pedagogy and Approaches
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Mechanical Engineering Division
Moderator: Anna Howard, North Carolina State University at Raleigh

This technical session will specifically focus on team- and project-based pedagogy in mechanical engineering.

Toward Interdisciplinary Teamwork in Japan: Developing Team-based Learning Experience and Its Assessment
Prof. Daigo Misaki, Kogakuin University
Miss Xiao Ge, Stanford University

T338C - Mechanical Engineering Technical Session: Dynamics I
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Mechanical Engineering Division
Moderator: Ronald Adrezin, United States Coast Guard Academy

This session includes a variety of topics that all share dynamics in common. From projects to pedagogy and coordinate systems to student anxiety, there is something for everyone.

A Cross-cohort Dynamics Project Study
Dr. Kamyar Ghavam, University of Waterloo
Dr. Homeyra Pourmohammadali, University of Waterloo
Mr. Lucas Botelho, University of Waterloo

Teaching Dynamics Using a Flipped Classroom Blended Approach
Dr. Sudeshna Pal, University of Central Florida
Dr. Anchalee Ngampornchai

An IMU for You and I
Dr. Andrew R. Sloboda, Bucknell University

WIP: The Predictive Power of Engineering Undergraduate Students’ Academic Self-efficacy and Test Anxiety for Their Academic Performance in a Dynamics Course
Daeyeoul Lee, Purdue University, West Lafayette
Prof. Jeffrey F. Rhoads, Purdue University, West Lafayette
Dr. Edward J. Berger, Purdue University, West Lafayette
Prof. Jennifer DeBoer, Purdue University, West Lafayette

**T338D - Mechanical Engineering Technical Session: Potpourri**

11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE

**Sponsor:** Mechanical Engineering Division

**Moderator:** Richard Freeman, United States Coast Guard Academy

This will be a fabulous session with papers on ethics, perceptions of pre-post-tenure requirements, and professional standards and exams. Don't miss it!

**Developing Student Professional Development Skills in Lifelong Learning and Engineering Standards**

Dr. Quamrul H. Mazumder, University of Michigan, Flint
Mingye Chen, University of Michigan, Flint
Sunzia Sultana, University of Michigan, Flint

**Generation-Z Learning Approaches to Improve Performance in the Fundamentals of Engineering Exam**

Dr. John Crepeau P.E., University of Idaho, Moscow
Dr. Barry Willis, University of Idaho, Moscow
Dr. Sean Quallen, University of Idaho, Moscow
Dr. Steven W. Beyerlein, University of Idaho
Mr. Dan Cordon, University of Idaho, Moscow
Dr. Terence Soule, University of Idaho
Mr. P.K. Northcutt II, University of Idaho
Ms. Terri A. Gaffney, University of Idaho
Mr. Jeffrey Kimberling, University of Idaho
Mrs. Angela C. Shears, University of Idaho
Ann Miller, University of Idaho

**Pre- and Post-tenure: Perceptions of Requirements and Impediments for Mechanical Engineering and Mechanical Engineering Technology Faculty**

Dr. Benjamin B. Wheatley, Bucknell University
Dr. Elif Miskioglu, Bucknell University
Dr. Eliana Christou, University of North Carolina at Charlotte
Dr. Nicholas Tymvios, Bucknell University

**Students Taking Action on Engineering Ethics**

Dr. Heather E. Dillon, University of Portland
Jeffrey Matthew Welch, University of Portland
Dr. Nicole Ralston, University of Portland
Rebecca D. Levison, University of Portland

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**T339 - Grading and Feedback Models in Mechanics**

11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE

**Sponsor:** Mechanics Division

**Moderators:** Vimal Viswanathan, San Jose State University; Julian Davis, University of Southern Indiana

**Replacing Graded Homework Assignments in Statics**

Prof. Charles S. White, Norwich University

**Objective Scoring Partial Credits by Tracking Failure Cascade in Mechanics Problem Solving**

Dr. Andrew Dongjin Kim, Georgia State University

**WIP: A Study of the Effect of Graded Homework in an Engineering Mechanics Course**

Dr. Robert O’Neill P.E., Florida Gulf Coast University
Dr. Ashraf Badir P.E., Florida Gulf Coast University
Dr. Galen I. Papkov, Florida Gulf Coast University
Dr. Jiehong Liao, Florida Gulf Coast University
Dr. Long Duy Nguyen P.E., Florida Gulf Coast University

**The Role of Timely Actionable Student Feedback in Improving Instruction and Student Learning in Engineering Courses**

Dr. Petros Sideris, Texas A&M University
Dr. Maria Koliou, Texas A&M University

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**T340A - Minorities in Engineering Division Technical Session 7**

10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE

**Sponsor:** Minorities in Engineering Division

**Moderators:** Christopher Carr, George Mason University; Samara Boyle, Using Classroom Activities to Integrate Concepts of Diverse Thinking and Teaming into Engineering Design (Experience)

Dr. Breigh Nonte Roszelle, University of Denver
Dr. Ronald R. DeLyser, University of Denver
Dr. Goncalo Martins, University of Denver
Dr. Christina Paguyo, University of Denver

**Catalyzing Institutional Change by Implementing a Faculty Development Program for Culturally Responsive Pedagogy at an HSI**

Dr. William A. Kitch, Angelo State University
Dr. Andrea L. Robledo, Angelo State University

**Strategies for Increasing Enrollment, Retention, and Graduation in Two Baccalaureate Degree STEM Programs: Mechanical Engineering Technology (MET) and Safety Management (SM)**

Dr. Heather E. Dillon, University of Portland
Jeffrey Matthew Welch, University of Portland
Dr. Nicole Ralston, University of Portland
Rebecca D. Levison, University of Portland
Dr. A. Mehran Shahhosseini, Indiana State University
Dr. Farman A. Moayed, Indiana State University
Dr. Alister McLeod, Indiana State University

T340B - Minorities in Engineering Division Technical Session 2
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Minorities in Engineering Division
Moderators: Jeremi London, Virginia Polytechnic Institute and State University; Christopher Carr, George Mason University

Student Education and Engagement at a Minority Institution
Dr. Ning Zhang, Central State University
Dr. Cadance Lowell, Central State University
Dr. Xiaofang Wei, Central State University
Dr. Desheng Liu, Ohio State University

Pre-engineering Collaboration as a Tool to Facilitate Decolonization of Native American Students
Dr. Robert V. Pieri, North Dakota State University
Dr. Austin James Allard, Turtle Mountain Community College
Teri Ann Allery
Ann Vallie, Nueta Hidatsa Sahnish College
Dr. Bradley Bowen, Virginia Tech
Mr. Karl Haefner
Mrs. Lori Nelson, Nueta Hidatsa Sahnish College
Danny Luecke
Mr. Michael Maloy Parker, Cankdeska Cikana Community College

Success Expectations of Low-income Academically Talented Students in Engineering: A Preliminary Study at a Hispanic-serving Institution
Dr. Aidsa I. Santiago-Román, University of Puerto Rico, Mayaguez Campus
Dr. Manuel A. Jimenez, University of Puerto Rico, Mayaguez Campus
Dr. Luisa Guillemaud, University of Puerto Rico, Mayaguez Campus
Dr. Sonia M. Bartolomei-Suarez, University of Puerto Rico, Mayaguez Campus
Prof. Oscar Marcelo Suarez, University of Puerto Rico, Mayaguez Campus
Prof. Nelson Cardona-Martínez, University of Puerto Rico, Mayaguez Campus
Dr. Carla López del Puerto, University of Puerto Rico, Mayaguez Campus
Dr. Nayda G. Santiago, University of Puerto Rico, Mayaguez Campus
Dr. Pedro O. Quintero, University of Puerto Rico, Mayaguez Campus
Dr. Anidza Valentín-Rodríguez, University of Puerto Rico, Mayaguez Campus

Improving STEM Education for Lower-division College Students at HSI by Utilizing Relevant Sociocultural and Academic Experiences: First-year Results from ASSURE-US Project
Dr. Jidong Huang, California State University, Fullerton
Dr. Sudarshan T. Kurwadkar, California State University, Fullerton
Dr. Doima Bein, California State University, Fullerton
Dr. Yu Bai, California State University, Fullerton
Dr. Salvador Mayoral, California State University, Fullerton

T341 - Mechatronics and Robotics I
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Multidisciplinary Engineering Division
Moderators: Nima Lotfi, Southern Illinois University Edwardsville; Luis Rodriguez, Milwaukee School of Engineering

This session highlights efforts to define and expand the diverse field of mechatronics and robotics. It is one of two sessions devoted to the topic; discussion between authors and attendees is anticipated.

Diversity and Inclusion in Mechatronics and Robotics Engineering Education
Dr. Christopher Pannier, University of Michigan-Dearborn
Dr. Carlotta A. Berry, Rose-Hulman Institute of Technology
Dr. Melissa Morris, Embry-Riddle Aeronautical University
Dr. Xiaopeng Zhao, University of Tennessee, Knoxville

Mechatronics and Robotics Education: Standardizing Foundational Key Concepts
Dr. Kevin Stanley McFall, Kennesaw State University
Dr. Kevin Huang, Trinity College
Hunter B. Gilbert, Louisiana State University
Prof. Musa K. Jouaneh, University of Rhode Island
Dr. He Bai, Oklahoma State University
Dr. David M. Auslander, University of California, Berkeley

STRIDER (Semi-autonomous Tracking Robot with Instrumentation for Data-acquisition and Environmental Research): Pitfalls and Successes of a Vertically Integrated Experiential Learning Project Spanning Multiple Years
Mr. Brandon Miles Gardner, University of Maryland, Eastern Shore
Dr. Abhijit Nagchaudhuri, University of Maryland, Eastern Shore
Mr. Jesu Raj Pandya, University of Maryland, Eastern Shore
Mr. Rakesh Joshi, University of Maryland, Eastern Shore
Mr. Fredrick Landon Bickle, University of Maryland, Eastern Shore
Dr. Mark E. Williams, University of Maryland, Eastern Shore

Practical Skills for Students in Mechatronics and Robotics Education
Dr. Carlotta A. Berry, Rose-Hulman Institute of Technology
Prof. Michael A. Gennert, Worcester Polytechnic Institute
Dr. Rebecca Marie Reck, Kettering University

T344 - Ocean and Marine Engineering Division: Best Paper Technical Session
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Ocean and Marine Division
Moderators: Vukica Jovanovic, Old Dominion University; Lynn Albers, Hofstra University

An Open-source Autonomous Vessel for Maritime Research
Dr. Robert Kidd, State University of New York

Using Student-faculty Collaborative Lectures to Teach High-level Hydrodynamics Concepts
Dr. Laura K. Alford, University of Michigan
Mr. James A. Colfer, University of Michigan
Dr. Robin Fowler, University of Michigan

T346 - Software Engineering Division Technical Session 1
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Software Engineering Division
Moderators: Robert Hasker, Milwaukee School of Engineering; Peter Clarke, Florida International University

A Course as Ecosystem: Melding Teaching, Research, and Practice
Dr. Edward F. Gehringer, North Carolina State University

Improving Student Learning Through Required Exposure to Other Students’ Code via Discussion Boards
Dr. Kyle D. Feuz, Weber State University
Dr. Linda DuHadway, Weber State University
Dr. Hugo Edilberto Valle, Weber State University
Dr. Richard C. Fry, Weber State University
Prof. Kim Marie Murphy, Weber State University

Teaching the Culture of Quality from the Ground Up: Novice-tailored Quality Improvement for Scratch Programmers
Dr. Eli Tilevich, Virginia Tech
Dr. Simin Hall, Virginia Tech

Mr. Peeratham Techapalokul, Virginia Tech

Introduction of Software Engineering Concepts for Electrical and Computer Engineering Students and Applications to Senior Projects
Dr. Danielle Marie Fredette, Cedarville University
Nathan Jessurun, University of Florida

Applying Slack to Help Teach Computer Science and Computer Engineering Courses
Dr. Chao Chen, Purdue University, Fort Wayne
Dr. Zesheng Chen, Purdue University, Fort Wayne

T347A - Student Division Technical Session 4
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Student Division
Moderators: Joel Schneider, Stanford University; Stephany Santos, University of Connecticut

Work in Progress: The Impact of XXXXX’s Student Council on the Grand Challenge Scholars Program
Ms. Rachel Figard, North Carolina State University
Mr. Pippin Payne, North Carolina State University

Paper: Bringing Science Education and Research together to REACT
Alyssa Travitz, University of Michigan
Ayse Muniz, The University of Michigan
Joanne Kay Beckwith, University of Michigan
Rose K. Cersonsky, University of Michigan

Student Success Impacts in Communication and Professional Networking Contexts
Dr. Alyson Grace Eggleston, The Citadel
Dr. Robert J. Rabb P.E., The Citadel

Hands-on Engineering Experience, a Liberal Arts Case
Dr. Niloofer Kamran, Cornell College
Mr. Qingbao Wang, Cornell College
Mr. Andy Grove
William Nitschke Dragon II, Cornell College

Unlocking the Creativity Potential
Dr. Robert M. Brooks, Temple University
Mr. Sangram Shinde, Department of Mechanical Engineering, Jazan University, Jazan KSA
T347B - Student Division Technical Session 5
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE

**Sponsor:** Student Division

**Moderator:** Kathryn Shroyer, University of Washington

**Augmented Reality for Education (Diversity)**

- Mr. Nima Shahab Shahmir, West Virginia University Institute of Technology
- Dr. Sanish Rai, West Virginia University Institute of Technology

**The Effectiveness of TRIZ from the Perspective of Comprehensive Benefits of Technological Innovation**

- Prof. Wei Yao, School of Public Affairs, Zhejiang University
- Dr. Chu Zhaowei, Zhejiang University
- Dr. Hu Shunshun, Zhejiang University
- Mr. Bifeng Zhang, Zhejiang University

**Paper: Exploring How Undergraduate Chemical Engineering Students Spend Their Time Inside and Outside of the Classroom (WIP)**

- Alaa Abdalla, Virginia Tech
- Dr. Nicole P. Pitterson, Virginia Tech
- Dr. Jennifer "Jenni" M Case, Virginia Tech

**A Systematized Review of the Students’ Upbringing Influence on their Spatial Reasoning**

- Mr. Hassan Ali Al Yagoub, Purdue University, West Lafayette

T351A - Women in Engineering Division Technical Session 8
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE

**Sponsor:** Women in Engineering Division

**Moderators:** Astrid Northrup, Northwest College, Powell WY; Sandra Eksioglu, University of Arkansas

**Women Enrolled in Engineering Programs: Their Interests and Goals**

- Ms. Katherine L Walters, University of Georgia
- Dr. John M. Mativo, University of Georgia
- Dr. Uduak Zenas George, San Diego State University

**A Comparative Study on Gender Bias in the Purchase of STEM Toys (Fundamental)**

- Mrs. Huma Shoaib, Purdue University
- Dr. Monica E. Cardella, Purdue University, West Lafayette

**Work in Progress: A Qualitative Exploration of Female Undergraduate Decisions to Specialize within Engineering Disciplines**

- Dr. M. Teresa Cardador, University of Illinois at Urbana-Champaign
- Prof. Karin Jensen, University of Illinois at Urbana-Champaign
- Dr. Kelly J. Cross, University of Nevada, Reno
- Ms. Grisel Lopez-Alvarez, University of Illinois at Urbana-Champaign

T351B - Women in Engineering Division Technical Session 10
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE

**Sponsor:** Women in Engineering Division

**Moderators:** Astrid Northrup, Northwest College, Powell WY; Sandra Eksioglu, University of Arkansas

**Mentoring Among African-American Women in the Engineering Academy**

- Jocelyn LaChelle Jackson, University of Michigan
- Dr. Jeremi S London, Virginia Polytechnic Institute and State University
- Crystal M. Pee
- Dr. Joi-Lynn Mondisa, University of Michigan
- Dr. Stephanie G. Adams, University of Texas at Dallas

**Improved Metric for Identifying Female Faculty Representation in Engineering Departments**

- Dr. Jennifer Retherford P.E., The University of Tennessee at Knoxville
- Dr. Sarah J. Mobley P.E., The University of Tennessee at Knoxville
- Dr. Kristen N. Wyckoff, The University of Tennessee at Knoxville

"I'm Not Good at Math," She Said

- Prof. Astrid K. Northrup P.E., Northwest College
- Dr. Andrea Carneal Burrows, University of Wyoming
Successful Strategies for Attracting More Female Students to Engineering Majors in Emerging Economies: The Case of Southern Mexico

Prof. Miguel X. Rodriguez-Paz, Tecnologico de Monterrey (ITESM)
Prof. Israel Zamora-Hernandez, Tecnologico de Monterrey
Mr. Jorge A. Gonzalez, Tecnológico de Monterrey
Dr. J. Asuncion Zarate-Garcia, Tecnologico de Monterrey (ITESM)

T352A - Community Engagement Division Technical Session 7
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Community Engagement Division
Moderators: Azadeh Bolhari, University of Colorado Boulder; AnnMarie Thomas, University of St. Thomas

Promoting Innovation Skills and Social Commitment in Engineering Students through the University Social Project Course

Dr. Flor Angela Bravo, Pontificia Universidad Javeriana
Dr. Juan M. Cruz, Rowan University
Prof. Jairo Alberto Hurtado JAH, Pontificia Universidad Javeriana

Designing Little Free Libraries for Community Partners in a First-Year Graphics and Design Course

Elizabeth Johnson, Playful Learning Lab
Elise Rodich, University of St. Thomas
Hannah French
Dr. AnnMarie Thomas, University of St. Thomas

Improving the Engineering Pipeline through University and Community-developed Museum-based Educational Kits

Dr. Stacey V. Freeman, Boston University
Dr. Sandra Lina Rodegher, Boston University

Engagement in Practice: Establishing a Culture of Service Learning in Engineering Orientation Classes at KSU

Dr. M. Loraine Lowder, Kennesaw State University
Dr. Christina R. Scherrer, Kennesaw State University
Dr. Kevin Stanley McFall, Kennesaw State University
Dr. David R Veazie P.E., Kennesaw State University

Student-led Initiative Promoting K-5 Hands-on Engineering Education

Ms. Shreya Gupta, Bit Project, College of Engineering, UC Davis
Mr. Dong Gyun Kim, Bit Project, College of Engineering, UC Davis
Ms. Victoria Kang Li Xu, Bit Project, College of Engineering, UC Davis

T352B - Community Engagement Division Technical Session 5
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Community Engagement Division
Moderators: Mary Andrade, University of Louisville; Romeo Ballinas-Gonzalez, Tecnologico de Monterrey (ITESM)

A Qualitative Study of Empathy in the Experiences of Students in a First-Year Engineering Service Learning Course

Mrs. Adetoun Yeaman, Virginia Polytechnic Institute and State University
Dr. Diana Bairaktarova, Virginia Polytechnic Institute and State University
Dr. Kenneth Reid, Virginia Polytechnic Institute and State University

Development of Empathy in a Rehabilitation Engineering Course

Dr. Lauren Anne Cooper, California Polytechnic State University, San Luis Obispo
Amanda Johnston, Purdue University, West Lafayette
Emily Honor Hubbard, California Polytechnic State University, San Luis Obispo
Dr. Brian P. Self, California Polytechnic State University, San Luis Obispo

Everybody Needs Somebody to Teach: Embodiment, Telecommunication, and Telepresence in STEM Learning

Mr. Glen Hordemann, Texas A & M University
Dr. Malini Natarajarathinam, Texas A&M University
Dr. Sharon Lynn Chu, University of Florida
Dr. Mathew Kuttolamadom, Texas A&M University
Prof. Francis Quek, Virginia Polytechnic Institute and State University
Mr. Osazuwa John Okundaye Jr, Texas A&M University

High Altitude Water Shortage Issues in Peru

Mrs. Mary Andrade, University of Louisville
Mr. Michael Scott Keibler, University of Louisville
Josh Rivard

How the Use of an Internet Radio Program and Podcast Helped Civil Engineering Students Engage with Local Communities in Need

Prof. Romeo Ballinas-Gonzalez, Tecnologico de Monterrey
Prof. Benjamin Sanchez, Tecnologico de Monterrey
Prof. Miguel X. Rodriguez-Paz, Tecnologico de Monterrey (ITESM)
Prof. Juan Arturo Nolazco-Flores, Tecnologico de Monterrey
T355 - Engineering Leadership Skills Development Across the Undergraduate-to-Workforce Transition

11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE

T357A - Research! Research! Research! in Faculty Development

11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE

Wisdom through Adversity: Situated Leadership Learning of Engineering Leaders

- Dr. Andrea Chan, Troost Institute for Leadership Education in Engineering (ILead)
- Dr. Cindy Rottmann, University of Toronto
- Dr. Doug Reeve P.Eng., University of Toronto
- Dr. Emily Moore P.Eng., University of Toronto
- Mr. Milan Maljkovic, Troost Institute for Leadership Education in Engineering
- Ms. Emily Macdonald-Roach

Using Competing Values Framework to Map the Development of Leadership Skills as Capstone Design Students Transition to the Workplace

- Mr. Tahsin Mahmud Chowdhury, Virginia Polytechnic Institute and State University
- Dr. Daniel Knight, University of Colorado, Boulder
- Dr. Daria A. Kotys-Schwartz, University of Colorado, Boulder
- Prof. Julie Dyke Ford, New Mexico Institute of Mining and Technology
- Dr. Homero Murzi, Virginia Polytechnic Institute and State University

An Evaluation of an Engineering Leadership Development Program on Alumni Job Placement and Career Progression

- Dr. Dena Lang, Pennsylvania State University
- Mr. Travis Gehr
- Dr. Meg Handley, Pennsylvania State University
- Dr. John Jongho Park, Pennsylvania State University
- Mr. Andrew Michael Erdman, Pennsylvania State University

A Narrative Inquiry into Pedagogical Approaches that Support the Development of Transversal Skills in Engineering Students

- Dr. Michele Norton, Texas A&M University
- Dr. Behbood Ben Zoghi, Texas A&M University

Come hear new and fun things about research in faculty development!

“It's Been a While”: Faculty Reflect on Their Experiences Implementing What They Learned During an Intensive Summer Program

- Dr. Ariana C. Vasquez, Colorado School of Mines
- Dr. Amy Hermundstad Nave, Colorado School of Mines
- Dr. Sam Spiegel, Colorado School of Mines

From Q&A to Norm & Adapt: The Roles of Peers in Changing Faculty Beliefs and Practice

- Amber Gallup, University of New Mexico
- Dr. Vanessa Svihla, University of New Mexico
- Ms. Madalyn Wilson-Fetrow, University of New Mexico
- Dr. Yan Chen, University of New Mexico
- Dr. Pil Kang, University of New Mexico
- Kristen Ferris, University of New Mexico

Validation of the Climate Scale in the Persistence of Engineers in the Academy Survey (PEAS)

- Dr. Julie Aldridge, Ohio State University
- Dr. So Yoon Yoon, University of Cincinnati
- Dr. Ebony Omotola McGee, Vanderbilt University
- Dr. Joyce B. Main, Purdue University at West Lafayette
- Dr. Monica Farmer Cox, Ohio State University

Career Development Impacts of a Research Program on Graduate Student and Postdoc Mentors

- Nicole McIntyre, University of California, Berkeley
- Dr. Catherine T. Amelink, Virginia Polytechnic Institute and State University
- Jeffrey Bokor, University of California
T357B - Research in Faculty Development
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Faculty Development Division
Moderator: Erica Hagen, University of Wisconsin - Madison

Come hear and ask questions about the latest research around faculty development!

**Analysis of Panel Summaries of Proposals Submitted to the S-STEM Program**
- Ms. Samara R. Boyle, Rice University
- Dr. Yvette E. Pearson P.E., Rice University
- Dr. Margaret E. Beier, Rice University
- Ms. Jacqueline Gilberto, Rice University
- Prof. Stephen P. Mattingly, University of Texas at Arlington
- Dr. Ann Saterbak, Duke University
- Anila K. Shethia, Rice University

**Bridging the Gap: Preparing Future Engineering Faculty for Post-secondary Teaching Excellence**
- Dr. Tareq Daher, University of Nebraska, Lincoln
- Dr. Markeya S. Peteranetz, University of Nebraska-Lincoln

**Organizational Citizenship Behavior and Faculty Mindset Amidst Professional Development Activities**
- Kristen Ferris, University of New Mexico
- Dr. Vanessa Svihla, University of New Mexico
- Dr. Pil Kang, University of New Mexico

**To Be, or Not to Be, a Professor: Views of Engineering Postdoctoral Scholars**
- Dr. Sylvia L. Mendez, University of Colorado at Colorado Springs
- Dr. Valerie Martin Conley, University of Colorado at Colorado Springs
- Dr. Sarah E. Cooksey, University of Colorado at Colorado Springs
- Ms. Kathryn Elizabeth Starkey, University of Colorado at Colorado Springs

T357C - WIP-ing Up Faculty Development!
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Faculty Development Division
Moderator: John Morelock, University of Georgia

Come learn about works in progress (WIPs) in the Faculty Development Division! What are people working on? Come find out!

**Evaluating the Teaching Evaluations of 100 North American Schools**
- Dr. Haroon Malik, Marshall University
- Dr. Wael A. Zatar, Marshall University

**Thinking Entrepreneurially about Your Career**
- Dr. Andrea L. Welker, Villanova University
- Dr. Maria-Isabel Carnasciali, University of New Haven
- Dr. Craig G. Downing, Rose-Hulman Institute of Technology
- Dr. Douglas E. Melton, Kern Entrepreneurial Engineering Network

**WIP: Mentoring Early-career Engineering Faculty - A Faculty Development Coordinator Model**
- Dr. Julie Walters, Oakland University
- Miss Leanne DeVreugd, Oakland University
- Dr. Laila Guessous, Oakland University

**WIP: Supporting Faculty Developers’ Engagement with Disciplinary Perspectives**
- Mr. Richard J. Aleong, Purdue University-Main Campus, West Lafayette (College of Engineering)

T360 - FOCUS ON EXHIBITS: Virtual Showcase
12:00 P.M. - 1:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: ASEE Headquarters

Live interaction with sponsors and exhibitors.
T371A - NSF Grantees: Diversity 3
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: NSF Grantees Session
Moderators: Amber Genau, University of Alabama at Birmingham; Alison Kerr, The University of Tulsa

Presentations from groups with current NSF-funded projects focused on understanding and supporting diverse populations within engineering.

**Military Veteran Students’ Pathways in Engineering Education (Year 6)**
- Dr. Susan M. Lord, University of San Diego
- Dr. Catherine Mobley, Clemson University
- Dr. Catherine E. Brawner, Research Triangle Educational Consultants
- Dr. Joyce B. Main, Purdue University, West Lafayette

**Investigating the Experiences of Military Professionals who Return to Engineering Graduate School**
- Dr. Diane L. Peters, Kettering University
- Dr. Elizabeth Gross, Sam Houston State University

**Increasing Diversity and Student Success in Engineering and Computer Science through Contextualized Practices**
- Dr. Doris J. Espiritu, Wilbur Wright College
- Dr. Ruzica Todorovic, Wilbur Wright College

**Early Research Scholars Program at UIC**
- Dr. Renata A. Revelo, University of Illinois at Chicago
  - Prof. Joseph Hummel
- Mohammad Taha Khan, University of Illinois at Chicago

**Expanding Access to and Participation in Midfield (Year 4)**
- Dr. Matthew W. Ohland, Purdue University, West Lafayette
- Dr. Susan M. Lord, University of San Diego
- Dr. Richard A. Layton P.E., Rose-Hulman Institute of Technology
- Dr. Marisa K. Orr, Clemson University
- Dr. Catherine E. Brawner, Research Triangle Educational Consultants
- Mr. Russell Andrew Long
- Mr. Hossein Ebrahiminejad, Purdue University at West Lafayette
- Mr. Hassan Ali Al Yagoub, Purdue University at West Lafayette

T371B - NSF Grantees: Identity
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: NSF Grantees Session
Moderators: Amber Genau, University of Alabama at Birmingham; Julia Williams, Rose-Hulman Institute of Technology

Presentations from groups with current NSF-funded projects focused on development of student identity within engineering education.

**Development and Refinement of Interview Protocol to Study Engineering Students’ Beliefs and Identities**
- Amy Kramer P.E., Ohio State University
- Dr. Emily Dringenberg, Ohio State University
- Dr. Rachel Louis Kajfez, Ohio State University

**Participation in Cocurricular Activities and the Development of Engineering Identity**
- Dr. Debra A. Major, Old Dominion University
- Seterra D. Burleson, Old Dominion University
- Xiaoxiao Hu, West Virginia University
- Dr. Kristi J. Shryock, Texas A&M University

**Interactions Between Engineering Student Researcher Identity and Epistemic Thinking**
- Dr. Lisa Benson, Clemson University
- Dr. Courtney June Faber, University of Tennessee at Knoxville
- Dr. Rachel Louis Kajfez, Ohio State University
- Dr. Marian S. Kennedy, Clemson University
- Dennis M. Lee, Clemson University
- Karina Sylvia Sobieraj, Ohio State University
- Cazembe Kennedy, Clemson University

**Partnership for Equity: Engaging with Faculty to Cultivate Inclusive Professional Identities for Engineers and Computer Scientists**
- Seoyeon Park, Texas A&M University
- Dr. Rebecca A. Atadero, Colorado State University
- Dr. Anne Marie Aramati Casper, Colorado State University
- Dr. Karen E. Rambo-Hernandez, Texas A&M University
- Dr. Jody Paul, Metropolitan State University of Denver
- Dr. Melissa Lynn Morris, University of Nevada - Las Vegas
- Dr. Christopher Douglas Griffin, West Virginia University
- Dr. Ronald R. DeLyser, University of Denver
- Dr. Christina Paguyo, University of Denver
- Dr. Scott T. Leutenegger, University of Denver

**CAREER: Actualizing Latent Diversity in Undergraduate Engineering Education**
- Dr. Allison Godwin, Purdue University at West Lafayette
- Ms. Brianna Shani Benedict, Purdue University at West Lafayette
- Ms. Brianna Shani Benedict, Purdue University at West Lafayette

Schedule subject to change. Please go to www.asee20.pathable.co for up-to-date information
T371C - NSF Grantees: Student Development

11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: NSF Grantees Session
Moderator: Michael Johnson, Texas A&M University

Presentations from groups with current NSF-funded projects focused on aspects of student development during undergraduate and graduate education in engineering.

Examining the Importance of Noncognitive and Affective (NCA) Factors for Engineering Student Success

Ms. Lily Krest, Purdue University at West Lafayette
Mr. Justin Charles Major, Purdue University at West Lafayette
Mr. Matthew Scheidt, Purdue University at West Lafayette
Ms. Julianna Ge, Purdue University at West Lafayette
Dr. Brian P. Self, California Polytechnic State University, San Luis Obispo
Dr. John Chen P.E., California Polytechnic State University, San Luis Obispo
Dr. James M. Widmann, California Polytechnic State University, San Luis Obispo
Dr. Allison Godwin, Purdue University at West Lafayette
Dr. Edward J. Berger, Purdue University at West Lafayette

A Qualitative Analysis of How a Student, Faculty, and Practicing Engineer Approach an Ill-structured Engineering Problem

Secil Akinci-Ceylan, Iowa State University
Dr. Kristen Sara Cetin, Michigan State University
Dr. Benjamin Ahn, Iowa State University of Science and Technology
Dr. Bora Cetin, Michigan State University
Dr. Andrea E. Surovec, South Dakota School of Mines and Technology

Learning Trajectories through Undergraduate Engineering Curricula and Experiences

Dr. Micah Lande, South Dakota School of Mines and Technology

Enhancing Graduate Education by Fully Integrating Research and Professional Skill Development within a Diverse,

Inclusive, and Supportive Academy

Dr. Eduardo Santillan-Jimenez, University of Kentucky
Dr. Qing Duan, University of Cincinnati
Dr. Jacinda K. Dariotis, University of Cincinnati
Prof. Mark Crocker, University of Kentucky

T371D - NSF Grantees: Student Thought

11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: NSF Grantees Session
Moderators: Amber Genau, University of Alabama at Birmingham; Jennifer Turns, University of Washington

Presentations from groups with current NSF-funded projects focused on systems of student thought, including ethics, problem solving, and decision making.

Student and Practitioner Approaches to Systems Thinking: Integrating Technical and Contextual Considerations

Ms. Erika A. Mosyjowski, University of Michigan
Mrs. Javiera Espinoza von Bischhofshausen, University of Michigan
Dr. Lisa R. Lattuca, University of Michigan
Dr. Shanna R. Daly, University of Michigan

Development of an Academic Dashboard for Empowering Students to be Adaptive Decision Makers

Dr. Marisa K. Orr, Clemson University
Baker A. Martin, Clemson University
Rebecca B. Spilka, Clemson University
Haleh Barmaki Brotherton, Clemson University
Ms. Katherine M. Ehlert, Clemson University

Engineering Undergrads Effectively Communicate Their Experience

Dr. Andrew Olewnik, State University of New York at Buffalo
Dr. Randy K. Yerrick, State University of New York at Buffalo
Mr. Manoj Madabhushi
Mr. Rachith R. Ramaswamy, State University of New York at Buffalo
Dr. Yonghee Lee, State University of New York at Buffalo
Ms. Hala Alfadhli, State University of New York at Buffalo
Amanda A. Simmons, State University of New York at Buffalo

Foundations of Social and Ethical Responsibility Among Undergraduate Engineering Students: Overview of Results

Dr. Carla B. Zoltowski, Purdue University at West Lafayette
Prof. Brent K. Jesiek, Purdue University at West Lafayette
Dr. Stephanie Claussen, Colorado School of Mines
Ms. Shiloh James Howland, Brigham Young University
Ms. Dayoung Kim, Purdue University at West Lafayette
Ms. Swetha Nittala, Purdue University, West Lafayette

**Ways of Experiencing Ethics in Engineering Practice: Variation and Factors of Change**

Dr. Carla B. Zoltowski, Purdue University, West Lafayette
Dr. Nicholas D. Fila, Iowa State University of Science and Technology
Dr. Justin L. Hess, Purdue University at West Lafayette
Alison J. Kerr, University of Tulsa
Ms. Dayoung Kim, Purdue University, West Lafayette
Dr. Michael C. Loui, University of Illinois at Urbana - Champaign
Dr. Andrew O. Brightman, Purdue University at West Lafayette

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**T399A - SPONSOR TECHNICAL SESSION: Presented by the University of Maryland**

11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Sponsored Sessions

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**T399B - SPONSOR TECHNICAL SESSION: Presented by Liaison**

11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Sponsored Sessions

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**T399D - SPONSOR TECHNICAL SESSION: Get Your Simple-to-Use TI-RSLK MAX Robot Fully Built, Tested, and Ready for Learning in Under 20 Minutes - Presented by Texas Instruments**

11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Sponsored Sessions

Moderators: Mark Easley, Texas Instruments, Inc.; Amanda Blair, Texas Instruments, Inc.

The newest addition to the TI-RSLK product family, the TI-RSLK MAX is user-friendly, can be assembled quickly, and provides hands-on options for teaching embedded systems design. With a solderless building process and updated curriculum to tackle many fundamental and trending topics in engineering, the kit can easily be implemented in large or small classes and is ideal for classes with time constraints, flipped classrooms, virtual distance learning, or limited lab technology. The low cost makes the kit accessible for students to own or for classroom sets to be reused year-over-year by students and faculty. The TI-RSLK MAX has the flexibility to teach students engineering fundamentals on design and testing, project-based learning, embedded systems, Internet of Things, controls, mechatronics, and more. This session will show you how to construct the robotics kit and how to test the functionality with our TI-RSLK MAX debug application.

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**T399E - SPONSOR TECHNICAL SESSION: Online Learning with MATLAB and Simulink - Presented by Mathworks**

11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Sponsored Sessions

Moderators: Elvira Osuna-Highley, MathWorks; Jeffrey Alderson, MathWorks

Educators are having to adapt their courses to achieve their learning objectives while faced with changing student and university requirements. As part of the transition, educators need to provide hands-on experience through lab-based modules. MathWorks provides several cloud-based tools to enable creation of flexible teaching and learning plans. In this session, we’ll discuss how these tools can contribute to course development and delivery workflow with potential for immediate use in classes and labs.

We will discuss several resources including:

- Accessing MATLAB and Simulink Online for anytime, anywhere use
- Leveraging interactive content with self-paced courses, MATLAB Apps, and Live Scripts
- Virtualizing labs through simulation and/or hardware accessible at home
- Mentoring students at scale with automated assessment and feedback in MATLAB Grader
- Connecting students with the community by participating in the MATLAB user community

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**T399F - SPONSOR TECHNICAL SESSION: Assessments in the Online Engineering Classroom - Presented by Wiley**

10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Sponsored Sessions

Moderators: Kellie Grasman, Missouri University of Science and Technology; Jeff Thomas, Missouri University of Science and Technology

Pivoting to online teaching can prove challenging, especially in problem-based engineering courses. Administering engineering homework, projects, and exams in a virtual environment requires a thoughtful approach. Two experienced educators will share their strategies and tips for managing assessment online based on decades of collective experience.
T411A - Joint Panel: Moving Engineering Forward with Micro-Mobility
1:00 P.M. - 1:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Cooperative and Experiential Education Division
Moderators: Lindsay Corneal, Grand Valley State University; Mary Andrade, University of Louisville
Speakers: Dr. John Farris, Grand Valley State University; Dr. Diane L Peters P.E., Kettering University; Mr. Giorgio Mariano

Freedom of movement drives human progress, and the new forms of micro-mobility have a significant impact on engineering education. Currently in its infancy, the micro-mobility movement provides a transformational shift in urban transportation, emerging as an alternative to traditional transportation modes. From bikes to scooters to self-driving autonomous delivery vehicles to various forms of electric wheels, advances in micro-mobility have taken many cities by storm. The micro-mobility movement has the potential to improve transportation in congested cities, assist the elderly and disabled with freedom of movement, deliver life-saving medical devices and supplies, and provide a powerful tool in the fight to increase access to transportation for traditionally underserved communities. In the past couple of years, these modes of transportation have emerged as a true potential solution for urban mobility, enabled by advances in GPS tracking, connectivity, lower cost and increased longevity of batteries, and the ubiquity of smartphone technologies. This is a 30-minute live (synchronous) interactive session. Speakers will give a brief introduction and presentation on health and transportation-related micro-mobility projects, followed by an opportunity for attendees to discuss topics of interest in a group setting.

T411B - Joint Panel: Developing a Talent Pipeline through Cooperative/Experiential Education in Applied Research
1:00 P.M. - 1:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Cooperative and Experiential Education Division
Moderators: Casey Thelenwood, Grand Valley State University; Katherine McConnell, University of Colorado Boulder
Speakers: Dr. Bogdan Adamczyk, Grand Valley State University; Dr. Brent Nowak, Grand Valley State University; Jonathan Engelsma

Developing a sustainable talent pipeline is critical for applied research organizations. Organizations benefit from hiring internship/co-op students who can adapt to a research environment, develop professionalism, creativity, and a problem-solving skill set, and provide the necessary depth and breadth for research-based projects to provide a value-added benefit. The 30-minute panel discussion will focus on the organizational structure/business model, internship/co-op recruitment process, training and acclimation into a research-based culture, the development of a professional and technical skillset, overcoming a significant learning curve, commitment to an individual and group contribution, and the appropriateness of project work to develop students into full-time research engineers. This is a live interactive panel session. Speakers will give a brief introduction and presentation, followed by an opportunity for attendees to discuss topics of interest in a group setting.

T414 - Research on Engineering Practice: Catalyzing the Next Generation of Scholars
1:00 P.M. - 1:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Educational Research and Methods Division
Moderators: Samantha Brunhaver, Arizona State University, Polytechnic campus; Alexandra Strong, Florida International University; Brent Jesiek, Purdue University at West Lafayette; Russell Korte, The George Washington University

This ASEE special session is part of a National Science Foundation-sponsored collaborative conference grant to catalyze a scholarly community around research on engineering practice. One of the overarching goals of this grant has been to foster a diverse community of scholar-practitioners engaged and interested in the study of engineering practice, particularly at the early career level (e.g., graduate students, postdoctoral researchers, and early-career research scientists and faculty members). A selected panel of early-career scholars will present brief lightning talks introducing themselves and their work. The scholars will then show a poster about a project and their broader research and career interests related to engineering practice, for feedback, ideas, and support from session attendees. Please join us in celebrating the ideas and accomplishments of this next generation of research on engineering practice scholars!

T416 - ECC and Manufacturing Divisions - NSF Guest Speaker Session
1:00 P.M. - 1:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsors: Energy Conversion and Conservation Division; Manufacturing Division
Moderators: Siamak Farhad, The University of Akron; Seyed Mousavinezhad, Idaho State University
Speaker: Dr. Pushpa Ramakrishna

The Energy Conversion (ECCD) and Manufacturing divisions announce their joint session focused on green energy manufacturing and sustainable energy waste management related to manufacturing. We are looking forward to abstracts addressing development and implementation of pedagogical tools and strategies, hands-on learning, and capstone design projects related to education areas in energy conversion and manufacturing processes.
T421 - Metrics and Measuring Research Impact: What Engineering Librarians Really Need to Know
1:00 P.M. - 1:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Libraries Division
Moderators: Daniela Solomon, Case Western Reserve University; William Bowman, Florida Institute of Technology
Speakers: Mrs. Sylvia Jones, Southern Methodist University; Mr. Tom C. Volkening, Michigan State University

This panel will provide engineering librarians with substantive insight into the applicability of research impact metrics, covering both their strengths and their limitations.

T445 - STEAM Education
1:00 P.M. - 1:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Physics and Physics Division
Moderators: Bala Maheswaran, Northeastern University; Robert Ross, University of Detroit Mercy
Speakers: Marie Bukowski; Ms. Rachelle Reisberg, Northeastern University; Dr. Stacy S Klein-Gardner, Vanderbilt University

This session provides P-12 Science, Technology, Engineering, Arts, and Math (STEAM) education and covers the following:
- The current state of P-12 STEAM programs
- Issues related to diversity and inclusion in STEAM
- Experiential learning activities for P-12 STEAM
- Increase talent pool by improving P-12 STEAM Experiential education to enter colleges
- Strengthen the skills of teachers through additional training in Experiential Learning approach
- The future progress of STEAM worldwide

T451 - Busting a Career Move? When and Why or Why Not?
1:00 P.M. - 1:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Women in Engineering Division
Moderator: Adrienne Minerick, Michigan Technological University

Across our careers as academic faculty and/or administrators, we all wonder: When is it time to move on? Should we move on? How do we move on? This panel is focused on addressing these questions. A broad range of experiences and wisdom regarding this challenging decision will be shared. Individuals will provide insights into a) choosing not to move on and remain at an institution, and b) why they chose to move on. Panelists will explore what benefits and costs arose from each decision. While diverse panelists will be selected, the organizers realize that the speakers offer only their own experiences, and so there will be focused time for questions and input from other participants. Please join us for a focused discussion on career self-authorship.

Panel: Busting a Career Move? When and Why or Why Not?
Dr. Adrienne R. Minerick, Michigan Technological University
Dr. Jenna P. Carpenter, Campbell University
Dr. Cindy Waters, Naval Surface Warfare Center
Dr. Beena Sukumaran, Rowan University

T455 - We The North: Engineering Leadership Programs in Canada
1:00 P.M. - 1:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Leadership Development Division
Moderators: Cindy Rottmann, University of Toronto; Meg Handley, Pennsylvania State University
Speakers: Dr. Emily Moore P.Eng., University of Toronto; Nate Quitoriano, McGill University; Tamara Etmansski, University of British Columbia; Marnie Jamieson P.Eng., University of Alberta; Darren Meister, University of Western Ontario; Amy Hsiao, University of Prince Edward Island

The ASEE LEAD Division is hosting a panel session highlighting six engineering leadership initiatives in Canada. Panelists will be invited to provide short overviews of their engineering leadership efforts, accomplishments, and struggles, followed by a question and answer period. Panelists are encouraged to share programmatic, curricular, or co-curricular elements that relate to ASEE LEAD’s four strategic initiatives: design, explore, assess and inform.

DESIGN: How/when did your engineering leadership initiative come to be? Key features?
EXPLORE: Describe your outreach efforts with industry and/or community partners
ASSESS: How have you assessed your efforts along the way?
INFORM: How have you helped university faculty and administrators understand the significant value of the field of engineering leadership in academia and practice?

The panel will conclude with a discussion of the six programs viewed through a conceptual framework generated in Klassen et al’s 2016 ASEE Annual Conference paper - Charting the Landscape of Engineering Leadership in North American universities—and a Q and A session.
**T456 - Military and Veterans Division Panel Session**
1:00 P.M. - 1:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Military and Veterans Division
Moderator: Patrick Bass, The Citadel
Discussion of veteran transition process concerning, military, semi-military, and civilian academic institutions.

**T458 - TUESDAY Keynote Live Question and Answer**
2:00 P.M. - 2:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: ASEE Board of Directors
Moderator: Sheryl Sorby, University of Cincinnati
Speaker: Remi Duquette
Live question and answer with Remi Duquette, moderated by ASEE President-Elect Sheryl Sorby.

**T478 - Demographics and Enrollment Challenges**
1:00 P.M. - 1:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Undergraduate Experience Committee
Moderators: Jenna Carpenter, Campbell University; David Tomasko, Ohio State University
Speakers: Dr. Stephanie G. Adams, University of Texas at Dallas; Jane Dong; Prof. Mark O. Federle P.E., Marquette University; Dr. Jumoke ‘Kemi’ Ladeji-Osias, Morgan State University; Dr. Jenna P. Carpenter, Campbell University; Dr. David L. Tomasko, Ohio State University
This session will give an overview of national demographic-related enrollment trends at the undergraduate and graduate levels in engineering, with information on how they are projected to change over the next decade. Panelists will then address the demographic and enrollment challenges at each of their respective institutions, including which of these are unique to their institutional profile, what strategies they have employed to address these issues, the consequences of these trends on their campus and programs/departments, their biggest concerns/challenges moving forward related to enrollment trends, and ideas on how ASEE members might work together to collectively address these issues.

**T499 - Round Table Discussion Presented by the University of Maryland**
1:00 P.M. - 2:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Sponsored Sessions
Moderator: Nathan Kahl, American Society for Engineering Education

**T504 - Biomedical Engineering Division Business Meeting**
3:30 P.M. - 4:30 P.M., ONLINE, A VIRTUAL CONFERENCE
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 - CHED Executive Board Meeting**
3:30 P.M. - 4:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Chemical Engineering Division

**T506 - Best in 5 Minutes: Demonstrating Interactive Teaching Activities**
2:30 P.M. - 3:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsors: Civil Engineering Division; Environmental Engineering Division
Moderators: Charles Riley, Oregon Institute of Technology; Shannon Parks, University of Pittsburgh at Johnstown; David Sanchez, University of Pittsburgh
This session features short papers describing impactful classroom moments, including demonstrations, student activities, or experiences that include physical models, virtual reality, in-class physical activities, illustrative experiments, experiential learning, and dynamic feedback mechanisms. The audience may be active participants!

**Best in 5 Minutes: Improving Students' Conceptual Understanding of Arch Construction and Behavior Using Physical Models of Masonry Arches in a Classroom Exercise**
Dr. Rachel Herring Sangree, Johns Hopkins University
Dr. Benjamin W. Schafer, Johns Hopkins University

**Coordinating Field Trips for Design Courses**
Prof. Scott A. Civjan P.E., University of Massachusetts, Amherst

**Mechanics of Reinforced Concrete Beams – The Whole is Greater than the Sum of its Parts**
ASEE’S VIRTUAL CONFERENCE
TUESDAY, JUNE 23 SESSIONS #ASEEVC

Dr. Daniel Hochstein, Manhattan College
Three Models and Engineering Analysis
Dr. Timothy Aaron Wood, The Citadel

Yielding and Fracture in Steel Design: From Trash Bags to Treasure
Dr. Anthony Battistini, Angelo State University

Engaging Students Through an Interactive Mass Balance Fundamentals Demonstration
Dr. Benjamin Michael Wallen P.E., United States Military Academy
Dr. Michael A. Butkus, United States Military Academy
Major Nathaniel P. Sheehan, United States Military Academy
Capt. Andrew Ng, United States Military Academy
Lt. Col. Andrew Ross Pfluger, United States Military Academy

Making Water Work: An Energy Head Equation Demonstration
Major Ruth Abigail Mower, United States Military Academy
Major Erick Martinez P.E., United States Military Academy
Lt. Col. Landon M. Raby, United States Military Academy
Major John Boyle, United States Military Academy, West Point
Lt. Col. Andrew Ross Pfluger, United States Military Academy

The Five-minute Adsorption Demonstration
Dr. Michael A. Butkus, United States Military Academy
Mr. Anand Deju Shetty, United States Military Academy
Dr. Benjamin Michael Wallen P.E., United States Military Academy
Major Nathaniel Sheehan, United States Military Academy
Lt. Col. Andrew Ross Pfluger, United States Military Academy

T513 - DEED Business Meeting
3:30 P.M. - 4:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Design in Engineering Education Division
Annual business meeting.

T514 - ERM Business Meeting
3:30 P.M. - 4:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Educational Research and Methods Division
This is the annual business meeting of the Educational Research and Methods (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 ERM activities.

T518 - EDGD Executive Committee Meeting
3:30 P.M. - 4:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Design Graphics Division
This is a meeting of the executive committee of the Engineering Design Graphics Division, moderated by the chair, Heidi M. Steinhauer.

T519 - Engineering Economy Division Business Meeting
3:30 P.M. - 4:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Economy Division
This meeting will discuss the yearly activities of the division and the professional interest council. 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.

T521 - ELD Round Table Discussions
3:30 P.M. - 4:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Libraries Division
This session provides an opportunity for small group discussions on a variety of topics involving engineering librarianship. Session moderated by Amy Van Epps (Harvard University) and Bruce D. Neville (Texas A&M University).

T507 - CIPD Board Meeting
3:30 P.M. - 4:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: College Industry Partnerships Division
For current board members and other interested parties.

T508 - CoED Division Business Meeting
6:00 P.M. - 8:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Computers in Education Division
CoED Division business meeting.
T523B - ECET Dept Heads Meeting
3:30 P.M. - 4:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Technology Division
Annual meeting for ECET department chairs.

T523C - ETD Executive Board
3:30 P.M. - 4:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Technology Division
Summer meeting of ETD officers and interested others.

T527 - FYEE Steering Committee Meeting
2:30 P.M. - 3:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: First-Year Programs Division
A meeting for the FYEE Steering Committee and future conference hosts. By invitation only.

T533 - Pre-College Engineering Education Division Business Meeting
3:30 P.M. - 4:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Pre-College Engineering Education Division
Business meeting.

T547 - ERM Community Welcome Session
2:30 P.M. - 3:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsors: Student Division; Educational Research and Methods Division
Moderators: Cassandra Woodcock, University of Michigan; Peter Odom, Purdue University at West Lafayette
This is a free ERM-sponsored event that brings together new and established ERMers for an interactive conversation. Come meet members of our division, learn about ERM events, and discuss current topics of interest to our community.

T560A - DIVERSITY ROUND TABLE - The Impact of COVID-19 on Underrepresented Engineering Students
2:30 P.M. - 3:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: ASEE Headquarters
Moderators: Agnieszka Miguel, Seattle University; Stephanie Farrell, Rowan University
In response to the COVID-19 outbreak, universities around the country moved to remote instruction for the remainder of spring term. Faculty and staff were directed to work remotely, and students were asked to move out of their residence halls—presumably to homes where they were expected to have Internet access and a place to study so that they could participate in virtual learning.

“Stay-at-home” orders issued for most states in the nation have prevented students from physically meeting their friends and peers to study together or receive support and encouragement in person. Many who were counting on jobs during spring term to support themselves have not been able to work. Their parents may be going through financial difficulties due to the closure of many non-essential businesses.

History has taught us that in the times of a national crisis, those from marginalized populations suffer the most. The gap between students who belong to disadvantaged groups and those who do not widens. Research has shown that the ability to identify with engineering and the feeling that they belong in their undergraduate peer group is key to students’ persistence, satisfaction, and self-efficacy. This is especially true for students from underrepresented groups. Furthermore, students from marginalized groups benefit from supportive learning communities more than others.

In this round table, we will discuss the impact of COVID-19 on engineering students, especially those who belong to underrepresented groups. How has the abrupt conversion to virtual learning affected students’ self-efficacy, motivation, persistence, and engineering identity? What are examples of successfully maintaining supportive learning communities during a pandemic? What are other best practices that lead to offering equitable and inclusive virtual education for all students in our community?
T567A - PNW Section Mixer
2:30 P.M. - 3:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Council of Sections
Please join your colleagues for the 12th Annual Pacific Northwest Section Mixer.

T567B - Zone I Business Meeting
2:30 P.M. - 3:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Council of Sections
Zone I promotes, encourages, and facilitates the various activities of ASEE’s Mid-Atlantic, Northeast, and St. Lawrence sections. This meeting is open to all attendees.

Moderator: Pritpal Singh – Council of Sections, Zone I Chair - Villanova University

T567C - Zone II Business Meeting
2:30 P.M. - 3:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Council of Sections
Zone II promotes, encourages, and facilitates the various activities of ASEE’s Illinois-Indiana, North Central, and Southeastern sections. This meeting is open to all attendees.

Moderator: Andrew Kline – Council of Sections, Zone II Chair - Western Michigan University

T567D - Zone III Business Meeting
2:30 P.M. - 3:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Council of Sections
Zone III promotes, encourages, and facilitates the various activities of ASEE’s Gulf Southwest, Midwest, and North Midwest sections. This meeting is open to all attendees.

Moderator: Kenneth Van Treuren – Council of Sections, Zone III Chair - Baylor University

T567E - Zone IV Business Meeting
2:30 P.M. - 3:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Council of Sections
Zone IV promotes, encourages, and facilitates the various activities of ASEE’s Pacific Northwest, Pacific Southwest, and Rocky Mountain sections. This meeting is open to all attendees.

Moderator: Lily Gossage – Council of Sections, Zone IV Chair - California State Polytechnic University

T567F - Council of Sections Meeting
3:30 P.M. - 4:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Council of Sections
Meeting of the Section and Zone leadership to promote discussion, discover promising opportunities, and chart future direction.

Moderator: Gary Steffen – Vice President of Member Affairs – Purdue University Fort Wayne

T573F - PIC I Business Meeting
2:30 P.M. - 3:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Professional Interest Council

T573G - PIC II Business Meeting
2:30 P.M. - 3:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Professional Interest Council

T573H - PIC III Business Meeting
2:30 P.M. - 3:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Professional Interest Council

T573I - PIC IV Business Meeting
2:30 P.M. - 3:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Professional Interest Council

T573J - PIC V Business Meeting
2:30 P.M. - 3:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Professional Interest Council

T577B - Safe Zone Level 1
3:30 P.M. - 4:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsors: ASEE Commission on Diversity, Equity & Inclusion; First-Year Programs Division
Moderators: Karin Jensen, University of Illinois at Urbana-Champaign; Brandis Keller, Texas A&M University
Speakers: Dr. Adrienne Minerick, Michigan Technological University; Dr. Kelly J Cross, University of Nevada, Reno

Did you know…
• 1 in 5 LGBTQIA+ students fear for their physical safety on college campuses?
Therefore, the panel discussion participants desire to challenge the public and scholarly discourse that has offered reasons for the dismal status of black Americans in engineering without complex analyses of the contributions of systemic racism to this ongoing problem. Specifically, in the realm of K-12 engineering education, an abundance of initiatives have sprung forth as a result of calls to broaden participation, but very few identify the circumstances that first excluded blacks from participation in the field or explicitly address the myriad barriers that currently hamper their engagement. We see the failure in the engineering field to recruit, retain, and successfully prepare black students as a crisis, and as black scholars we each leverage our experience, intellect, and talents toward innovative solutions to this critical situation.

Storytelling can be a powerful educational tool; in fact, we will borrow from the autoethnographic research tradition to stimulate a scholarly discussion that moves toward more equitable teaching and practice by elucidating contradictions in teaching engineering that others (non-blacks) may not be attuned to. Autoethnographers view research and writing as socially just acts rather than a preoccupation with accuracy; the goal is to produce analytical, accessible texts that change us and the world we live in for the better (Ellis, Adams, and; Bochner, 2011). The process of self-exploration and interrogation aids individuals in locating themselves within their own history and culture, allowing them to broaden their understanding of their own values and experiences in relation to others. Having successfully navigated the educational system as a black Americans studying engineering, we aim to share insights from our experiences that are useful to expand the conversation around low representation of black students beyond deficit narratives.

This panel will begin with participants acknowledging their current roles and engagement within the field of engineering as well as their educational trajectory that led to their current positions. They then will discuss the pivotal experiences that contributed to their epistemological and ontological identity formations as engineers, and how their racial identity influenced these progressions. Participants will be encouraged to share ecological factors that promoted their successful matriculation through multiple engineering programs at various institutions of higher education. In addition to sharing their own stories, panel participants will be asked to explain how their experiences inform their research, teaching, and other work within engineering. Audience members will then be aided in time of reflection to consider the information expressed by the panelists, before concluding with time for questions.

### T578 - UEC Associate/Assistant Deans Meeting

**3:30 P.M. - 4:00 P.M., ONLINE, A VIRTUAL CONFERENCE**

**Sponsor:** Undergraduate Experience Committee

**Associate Deans Meeting**

**Organizer:** Dr. Jerome Lavelle, Associate Dean, North Carolina State University

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**T577C - Do You See Me?: Hypervisible Invisibility #EngineeringWhileBlack**

**2:30 P.M. - 3:30 P.M., ONLINE, A VIRTUAL CONFERENCE**

**Sponsors:** ASEE Commission on Diversity, Equity & Inclusion; Minorities in Engineering Division

**Moderators:** Federica Robinson-Bryant, Embry-Riddle Aeronautical University - Daytona Beach; Susan Walden, University of Oklahoma

**Speakers:** Dr. James Holly, Jr.; Ms. Chanel Beebe, Purdue University at West Lafayette; Mr. Donovan Colquitt, Purdue University at West Lafayette; Ms. DeLean Tolbert, University of Michigan - Dearborn

Black men and women are capable, dignified, and tenacious. Nevertheless, underrepresentation of black individuals within the field remains a stubborn issue at all levels. While many explanations have been offered anecdotally and within literature, this panel discussion will offer engineering stakeholders an insider view on what it’s like to be black in engineering. Beyond conversation, we’d like to suggest ways of affirming black students’ academic and racial/cultural identity.

- Attendees will be encouraged to critique mainstream justifications for the scant presence of black people in engineering.
- Attendees will be aided in identifying new ways of teaching and supporting black students and professionals.
- Attendees will be exposed to innovative ways to identify engineering skills that black students exhibit in non-engineering contexts.

As engineering educators and researchers, it is imperative that we examine the consequences of our broader sociohistorical context on the academic content and culture in which we exist. This is of particular importance as calls for broadening participation in engineering continue to increase.
T601 - VIRTUAL WORKSHOP:
Workshop on Pico/Nano/Micro-
satellite Engineering (Life Cycle of a PNMSat Mission and Hands-
on Experience Using Classroom Satellite Kit)
4:30 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Aerospace Division
Speaker: Dr. Sharan Asundi, Old Dominion University

The goal of this workshop is to provide an overview of PNMSat Engineering and a three- to five-year road map to successfully start a PNMSat program and potentially launch an academic satellite. The underlying intent of the workshop is to emphasize the integration of education, research, and development to sustain a PNMSat program at an academic institution.

T614A - VIRTUAL WORKSHOP:
Using Power, Privilege, and Intersectionality as Lenses to Understand our Experiences and Begin to Disrupt and Dismantle Oppressive Structures Within Academia
4:30 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Educational Research and Methods Division
Speakers: Dr. Nadia N. Kellam, Arizona State University; Dr. Vanessa Svihla, University of New Mexico; Dr. Donna M Riley, Purdue University at West Lafayette; Dr. Alice Pawley, Purdue University at West Lafayette; Dr. Kelly J. Cross, University of Nevada, Reno

The presenters will frame the session and set ground rules for inclusive interaction before guiding attendees through a role-playing activity, development of an intersectionality wheel, and the development of strategies for overcoming these power differentials in academia.

We will begin the special session with introductions, a discussion of the ground rules and the objectives for the session. In these introductions, we will have attendees share their name, preferred pronouns, and interest and expertise in the topics of this workshop.

Then we will move into a series of role playing, fish bowl activities where volunteers will role play using provided, detailed character vignettes, and where an academic leadership team that consists of engineering administrators, engineering faculty, social science faculty, and a student officer of the Student Government Association is holding their first meeting as part of a diversity committee within the engineering college. After each round of the role playing scenario, groups of attendees will discuss identities within the team, the experiences of individuals on the teams, and discussions of broader structural inequalities that were brought to light through this scenario. Each attendee will then bring to mind a meeting that they have been a part of and consider these aspects of that meeting (individuals, identities, structural inequalities).

We will then identify intersectional “isms” that may produce boundaries and power differentials on interdisciplinary teams using role-play and individual experiences as starting points. With these “isms” identified (e.g., racism, tenurism, sexism, engineeringism), we will create individualized intersectionality wheels and consider how those “isms” impact lived experiences on teams. Intersectionality wheels include multiple spokes with each line representing an “ism” with the top half of the circle representing privileged positions and the bottom half representing oppression. An example of one of these lines is racism, with white being on the privileged, upper half and people of color on the oppressed, bottom half of the circle (see https://www.awis.org/intersectionality/ for an example of an intersectionality wheel). After creating these intersectionality wheels and building awareness around privilege on teams, participants will reflect on and discuss strategies for surmounting, managing, and mitigating these boundaries and power differentials.

Finally, we will discuss power, privilege, and intersectionality as it aligns with each of the facilitator’s work. For example, we will share an intersectionality wheel that we created based on data collected from Vanessa and Nadia’s pairRED study (Partnering across insider-views of RED teams) that includes leadership team members with different social identities and roles on various RED teams. This final presentation will also provide additional readings and resources for attendees interested in learning more about power, privilege, and intersectionality. Attendees can take both the new strategies discussed in the session and the protocol for developing intersectionality wheels back to their institutions to facilitate a similar session to use with future interdisciplinary teams.

T614B - VIRTUAL WORKSHOP:
Advancing Learning through Curricula Design and Enactment Utilizing the Engineering Learning Framework
4:30 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Educational Research and Methods Division
Speakers: Dr. Sam Spiegel, Colorado School of Mines; Dr. Amy Hermundstad Nave, Colorado School of Mines

Many faculty begin their careers with little or no formal education in teaching and learning. Yet teaching and learning is at the core of a university’s mission and business. To help faculty learn about the process of designing and delivering an effective course, we developed the Engineering Learning framework.

This interactive workshop will help new faculty (as well as experienced faculty who are interested in learning about course design) begin to design, or redesign, a course using the Engineering Learning framework. We will begin the session by brainstorming aspects of effective teaching. This first step is important to ensure that all participants can articulate a clear vision of what they mean by effective teaching and effective
courses. Following this introduction, we will introduce the Engineering Learning framework. In the remainder of the workshop, participants will consider a specific class that they are teaching or might teach in the future, and work through several aspects of the course design process using the Engineering Learning framework as a guide. Participants will leave the session with the framework and a jump start into the process of designing a course.

T628 - VIRTUAL WORKSHOP: Advising Graduate Students: Lessons Learned from the Dissertation Institute

4:30 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Graduate Studies Division
Speakers: Dr. Holly M. Matusovich, Virginia Polytechnic Institute and State University; Dr. Mayra S Artiles, Virginia Tech Department of Engineering Education; Dr. Stephanie G. Adams, University of Texas at Dallas; Mr. Juan M. Cruz, Virginia Polytechnic Institute and State University

Description:

The strategies that we will share in our workshop stem from a National Science Foundation-funded project titled the Dissertation Institute. The Dissertation Institute is a one-week intervention for minority students in the final phases of obtaining a doctorate. During this intervention, students are given a series of talks and tools for succeeding in the pursuit of a doctorate as well as time to practice these skills, particularly those relevant to writing. We also conduct research on our participants and their experiences in pursuing a doctorate.

From commonalities found in the data collected, we have developed a series of strategies to provide doctoral students with the precise support they need for success. Through the use of discussion and role-playing, participants will be able to learn and practice strategies on the following topics:

- Scaffolding students into independent research
- Building trust and rapport with your graduate students
- Leveraging opportunities to sustain degree progress
- Motivational strategies to help students get unstuck
- Managing the writing process
- Encouraging mental health awareness

This workshop is designed for all faculty who currently advise graduate students. Early career faculty are particularly encouraged to attend.

T638 - VIRTUAL WORKSHOP: Advancing Mechanical Engineering Education Through Mobile Learning Micro-Workshop Training

4:30 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Mechanical Engineering Division
Speakers: Dr. Krishna Pakala, Boise State University; Dr. Diana Bairaktarova, Virginia Polytechnic Institute and State University

This workshop will introduce participants to mobile technologies and learning strategies that can enhance learning for mechanical engineering (ME) students. Participants will see examples of how ME instructors used mobile learning strategies effectively in the classroom and identify ways to apply and transfer concepts through practice. Participants will engage in active learning through micro-workshops focused on relevant topics of digital learning, such as digital distraction, cloud-based collaboration, virtual office hours, and wireless presentation. Facilitators also will share highlights from a successful professional development program aimed at integrating mobile learning in higher education.

By participating in this workshop, attendees will:

1. Identify some mobile learning technologies and learning strategies which may be used for learning in a ME course
2. See examples of how effective mobile learning technologies and strategies were used by ME instructors
3. Identify ways in which effective mobile learning technologies and strategies can be used in their specific ME courses
4. Discuss the pros and cons of using mobile learning technologies and strategies in their course
5. Hear about a PD program designed to help ME instructors and others in using mobile tech and strategies for increasing student learning

Technology and Workshop Plan Technology: Smartphones and Tablets

In this workshop participants will:

1. Pair and discuss how mobile learning technologies and strategies are currently being used at their institutions to advance learning in ME courses
2. Be introduced to a series of concepts related to digital learning; through corresponding micro-workshops, participants will have the opportunity to transfer concepts to practice
3. Hear methods by which the discussed digital concepts were applied by instructors for ME learning
4. Work in small groups to complete a provided template for mapping their individual plan for mobile learning integration in a ME course
5. Hear an overview of a successful professional development program for mobile learning at Boise State University

4:30 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Minorities in Engineering Division

Speakers: Dr. Krystal L. Williams; Dr. Eugene Anderson; Dr. Brian A. Burt, Iowa State University of Science and Technology

The session will begin with a presentation about national trends and the current status of engineering diversity. Afterwards, a collaborative learning breakout session will ensue led by engineering education and policy scholars. The breakout groups will be organized around the following themes related to the scholars' expertise: The Male Minority: Understanding the Experiences of Black Males in Engineering; Promising Institutional Diversity and Inclusion Practices; and Engineering Pathways: Connecting K-12 and Higher Education to Broaden Participation for Students of Color.

T657 - VIRTUAL WORKSHOP: Transforming Inclusive Teaching, Mentoring, and Academic Advising in Engineering: A Core Competencies and Skills Framework

4:30 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Faculty Development Division

Speaker: Dr. April Dukes, University of Pittsburgh

This session is designed to engage participants in a research-based foundational framework of skills that underlie inclusive teaching, mentoring in a research setting, academic advising, and being an inclusive colleague. Participants will have a chance to explore how the skills in this framework are foundational across all of these activities, and practice several in real time. Participants will leave with concrete ideas for applying new knowledge across areas of their own practice.

This session will include both presentation of information, case-based discussions, and interactive elements. Content will include the following:

- A description of the foundational framework highlighting common skills and inclusion of an accompanying rubric to gauge progression and learning of these skills
- A discussion about social identities and relationship building
- A series of cases/scenarios that practice skills in different educational settings (e.g., teaching, mentoring in a research setting, academic advising, and being an inclusive colleague)

T699A - VIRTUAL WORKSHOP: Mastery-based Learning: From Exposure to Expertise

4:30 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Sponsored Sessions

Speakers: Dr. Sara A. Atwood, Elizabethtown College; Dr. Kurt M DeGoede, Elizabethtown College

We have spoken to many engineering faculty interested in implementing a mastery-based approach. These faculty find that students no longer come to their office hours, use shortcuts to simply get the "right answer" on homework problems, focus more on the grade than on learning, and ultimately leave their courses only "kinda" knowing how to do most things. A mastery-based approach places responsibility for learning back on the student and takes students from exposure to expertise on the fundamental topics in the course.

Attendees will leave with an understanding of how outcomes-based assessment differs from traditional approaches and the advantages and disadvantages of each, an overview of published research on best practices, and implementation tips and tricks. Attendees should bring a course syllabus and will spend much of the workshop developing a draft syllabus for a mastery-based rework of their course, including defining and organizing outcomes, structuring the details of grading policies, and thinking through a parallel shift in the logistics of class-session and testing environments.

Additional Information:

The presenters have used mastery-based learning in four courses spanning all levels of the curriculum and have presented this workshop by invitation to other engineering departments. Presenters will provide their own handouts.
Leading change during times of transition requires establishing an environment of trust and transparency. Authentic leaders create an environment shaped by a clear set of ideals and values to establish a foundation based on honesty, competency, trust, and transparency. Leading successfully during times of turmoil and transition requires both competence in technical skills as well as behavioral and human-relations skills, which include self-regulation and motivating and mentoring your colleagues as well as demonstrating empathy for those who may feel left behind. This is an active workshop using case studies and scenarios to increase understanding and establish trusting relationships that ultimately allow successful changes during times of transition.

Peer evaluations are widely used to monitor student teams, but faculty may not always know what to do with the results to improve student team experiences. This workshop will focus on post-processing various kinds of data gathered in peer evaluations – round-robin ratings of teamwork, process measures such as conflict and psychological safety, free-text comments, and more. Participants will consider case studies of de-identified data from the CATME system, interpret those cases in collaboration with others, and discuss approaches for intervening with students and teams – or if intervention is warranted. Those using CATME will derive particular benefit, but participants will benefit from the workshop even if they use other approaches to peer evaluation.

Want to support low-income, underprepared students in your engineering program? The Redshirting in Engineering model (inspired by the practice of redshirting in college athletics) is one approach to supporting this population through a combination of academic support curriculum, community building, intrusive advising, and summer bridge programming.

This workshop will include, but will not be limited to: a brief overview of the Redshirting in Engineering program model, a panel discussion of variations and common themes in implementation of the model between the six institutions in the Redshirting in Engineering consortium, guidance for participants to assess the fit of this program model for their institution, and time to work with peers and facilitators to develop a plan for implementing the Redshirting in Engineering model at their institutions.

Background: In 2009, University of Colorado Boulder started the GoldShirt program as an effort to increase equity in engineering by providing highly motivated and academically talented students from economically and educationally disadvantaged backgrounds with holistic support to help them succeed in engineering. CU-Boulder's model has since been adopted by five other institutions (the University of Washington and Washington State University in 2013; Boise State University, the University of California San Diego, and the University of Illinois Urbana-Champaign in 2016) and has been adapted to meet the needs of students in a wide range of institutional contexts. The six programs that comprise the Redshirt in Engineering Consortium have been largely successful and can serve as a model for other colleges with a commitment to increasing equity in engineering.

Workshop outline:

Hour 1 - Information about the Redshirting in Engineering model, including details about the population served and a brief overview of literature related to best practices for retention, essential components of the program model (serving low-income students from underrepresented backgrounds, summer bridge programs, community-building, academic, support, and intrusive advising). There will be time at the end of the hour for a short discussion of participants’ experiences with serving these populations and challenges they have experienced.

Hour 2 - Going through each of the essential components of the program with the panel, highlighting similarities and differences in implementation of these elements between programs to give participants an idea of the variations between programs and how the model can be customized to
fit institutional context. After hearing from the panel, participants will have a chance to work individually to determine which implementation option for each essential element would work best for their institutional context, what already exists at their institution, and what new ideas they have, then discuss in small groups.

Hour 3 - Discussing institutional readiness and fit for implementing the model, beginning with a brief presentation from the panel about (based on past experience from the consortium) the recommended number of low-income, underprepared students that need to be at an institution to make this work, types of data that should be gathered about these students and their experience at that institution, whether an institutional/college diversity plan is in place, and staffing needs to support a Redshirt program. Participants will be given time to think about these factors relative to their own institution, then discuss in small groups. The workshop will conclude with a Q&A with the panel.

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**T699E - VIRTUAL WORKSHOP:**
Partnering with the Engineering for Us All (E4USA) Advanced High School Course: Next Steps for All Stakeholders

*4:30 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE*

*Sponsor: Sponsored Sessions*

**Speakers:**
- Mr. Kevin Calabro, University of Maryland College Park; Jackelyn Raquel Lopez Roshwalb, University of Maryland College Park; Dr. Bruk T. Berhane, University of Maryland College Park; Dr. Adam R. Carberry, Arizona State University; Ms. Medha Dalal, Arizona State University; Dr. Stacy S. Klein-Gardner, Vanderbilt University; Dr. Jennifer Kouo; Dr. Jumoke ‘Kemi’ Ladefji-Osias, Morgan State University; Dr. Kenneth Reid, Virginia Polytechnic Institute and State University; Marnie Wong, Arizona State University

The workshop begins with an overview and an update of the NSF-funded Engineering For US All (E4USA) project (NSF award 1849430). E4USA is a national pilot of an advanced high school course in engineering that is accessible to all students and potentially college credit bearing. We will review the initial 2019-2020 pilot year and then form into breakout groups based on stakeholder roles:

~ PK-12 teachers and schools looking to offer the E4USA course
~ Institutions of higher education looking to offer credit and placement for E4USA students and/or interested in sponsoring a high school
~ Education service providers and curriculum writers looking to develop content to offer for use in E4USA classrooms
~ Professional development providers interested in co-developing and/or hosting professional development of local E4USA teachers
~ Researchers interested in the collection, analysis, and sharing of data from this program

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**T699F - VIRTUAL WORKSHOP:**
How to Identify Appropriate NSF Funding Programs and Prepare Competitive NSF Engineering Education Research Proposals

*4:30 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE*

*Sponsor: Sponsored Sessions*

**Speakers:**
- Edward Berger, National Science Foundation; Michelle Camacho, National Science Foundation; Monica Cardella, National Science Foundation; Dr. John Jackman, National Science Foundation; Dr. Paige E Smith, National Science Foundation; Amy Wilson-Lopez, National Science Foundation; Vinod Lohani, National Science Foundation

The engineering education community includes educators, industry practitioners, and professional organizations working collaboratively to attract, recruit, and retain a diverse group of students in engineering who can strengthen the U.S. economy and benefit society. The National Science Foundation (NSF) supports this community through multiple programs that invest in leading-edge engineering education research that advances our understanding of teaching, learning, and institutional change in engineering education at all education levels and in diverse settings. NSF serves as a catalyst for divergent thinking, innovation, and collaboration among engineering faculty and practitioners resulting in bold and innovative solutions to engineering education challenges. Selecting the right NSF program for your new idea and writing a compelling narrative are two critical steps in making your proposal competitive.

In this workshop, NSF program directors will provide guidance on how to identify appropriate funding programs and enhance the quality of proposals submitted to engineering education funding opportunities in the Divisions of Undergraduate Education (DUE), Research on Learning in Formal and Informal Settings (DRL), and Engineering Education Centers (EEC). This workshop will facilitate interactions with NSF program directors. Participants will learn about the proposal submission and administration process as well as how to identify areas in which their proposals can be enhanced. Additionally, participants will engage with Principal Investigators (PIs) of previously funded NSF projects to better understand the process of planning, crafting, and submitting engineering education research proposals from the PI perspective. The workshop will include a discussion of the merit review process followed by team-based review of a proposal previously submitted to NSF. Participants will leave the workshop with a better understanding of the engineering education research programs available as well as strategies to improve their proposals.

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**T701 - Aerospace Division Social**

*7:00 P.M. - 9:00 P.M., ONLINE, A VIRTUAL CONFERENCE*

*Sponsor: Aerospace Division*
T704 - BME Division Awards Virtual Social
7:00 P.M. - 9:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Biomedical Engineering Division
The ASEE BME Division virtual social is an opportunity to interact with your BME colleagues in an informal setting. 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!

T706 - Civil Engineering Division Annual Awards Banquet
7:00 P.M. - 9:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Civil Engineering Division
The annual awards banquet of the Civil Engineering Division celebrates the achievements of members of the division.

T717 - Engineering and Public Policy Social
7:00 P.M. - 9:00 P.M., ONLINE, A VIRTUAL CONFERENCE, TBD
Sponsor: Engineering and Public Policy Division
Informal gathering for division members. It's BYOB this year...

T736 - Materials Division Social Event
7:00 P.M. - 9:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Materials Division

T738 - ME Division Convivium
7:00 P.M. - 9:00 P.M., ONLINE, A VIRTUAL CONFERENCE, TBD
Sponsor: Mechanical Engineering Division
The Mechanical Engineering Convivium is a Division-supported social event for members and guests. Please consider joining us for a chance to reconnect with old friends - and make new ones!

T741 - Multidisciplinary Engineering Division Social
7:00 P.M. - 9:00 P.M., ONLINE, A VIRTUAL CONFERENCE, TBA
Sponsor: Multidisciplinary Engineering Division
As a virtual event, there is no ticket needed and no charge. Feel free to join Multidisciplinary Engineering members to share your ideas and experiences with multidisciplinary projects, courses, programs, and ideas/experiences with the new virtual world.

Contact MULTI Program Chair Cindy Barnicki (barnickc@msoe.edu) for additional details.

T745 - Engineering Physics and Physics Division Social Event
7:00 P.M. - 9:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Physics and Physics Division

Engineering Physics and Physics social event.

T747 - Student Division Social
7:00 P.M. - 9:00 P.M., ONLINE, A VIRTUAL CONFERENCE, PENDING
Sponsor: Student Division
Come meet with other students, network, and learn about opportunities to get involved in the student division.
W201 - Flight and Control Simulators for Virtual Learning
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Aerospace Division
Moderators: Waterloo Tsutsui, Purdue University at West Lafayette; Michael Hatfield, University of Alaska Fairbanks

A Next-Generation Flight Simulator Using Virtual Reality for Aircraft Design (Work in Progress)
Dr. Dominic M. Halsmer P.E., Oral Roberts University

Acquiring and Implementing an Air Traffic Control Simulator in a Higher Education Aviation Program
Dr. Meron Lindenfeld, Farmingdale State College, State University of New York
Prof. Louis A. Scala, Farmingdale State College, State University of New York

Implementation of an Inductive Learning and Teaching Framework for an Aircraft Flight Dynamics and Control Class
Dr. A. Ram Kim, Iowa State University
Dr. Benjamin Ahn, Iowa State University of Science and Technology
Prof. Matthew Erik Nelson, Iowa State University

Role of Agricultural Simulation Games to Promote Youth-Adult Discussions Related to Agricultural Sustainability
Nathan C. Rice, University of Nebraska, Lincoln
Dr. Jennifer Keshwani, University of Nebraska, Lincoln
Dr. Deepak R. Keshwani, University of Nebraska, Lincoln

Education and Research at the Nexus of Food, Energy, and Water with a 3-Axis Farming Robot
Dr. Abhijit Nagchaudhuri, University of Maryland, Eastern Shore
Mr. Jesu Raj Pandya, University of Maryland, Eastern Shore
Dr. Madhuni Mitra, University of Maryland, Eastern Shore
Travis Ford, University of Maryland, Eastern Shore

W203 - Biological and Agricultural Engineering Division Technical Session 1
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Biological and Agricultural Engineering Division
Moderator: Janie Moore, Texas A&M University

The Role of the Co-curricular Spaces in the Engagement and Success of Minority Students
Dr. Hamidreza Sharifan, Texas A&M University
Dr. Janie M. Moore, Texas A&M University

Garden TOOLS: Technology-rich Agricultural Engineering Opportunities in Outdoor Learning Spaces
Dr. Erin Ingram, University of Nebraska, Lincoln
Dr. Jennifer Keshwani, University of Nebraska, Lincoln
Mrs. Tammara J. Mittelstet, University of Nebraska, Lincoln
Dr. Julie Thomas, University of Nebraska, Lincoln

Biomedical Engineering Students Gain Design Knowledge and Report Increased Confidence When Continually Challenged with Integrated Design Projects
Dr. Steven Higbee, Indiana University Purdue University, Indianapolis
Dr. Sharon Miller, Indiana University Purdue University, Indianapolis

A Survey of Biomedical Design Projects to Inform Skill Development in a New Undergraduate Biomedical Engineering Curriculum
Ms. Kelsey Nicole Warren, Kansas State University
Dr. Charles Carlson, Kansas State University
Dr. Steve Warren, Kansas State University

Required Computer Science Education in BME Undergraduate Programs
Prof. Robert A. Linsenmeier, Northwestern University

Designing a MATLAB-based Escape Room
Ms. Lauren Nicole Heckelman, Duke University
Dr. Elizabeth Kathleen Bucholz, Duke University
An Assessment Instrument for User-centered Innovation Potential Among Biomedical Engineers
Carolina Vivas-Valencia, Purdue University, West Lafayette
Dr. Nan Kong, Purdue University, West Lafayette
Mrs. Eunhye Kim, Purdue University, West Lafayette
Dr. Senay Purzer, Purdue University, West Lafayette
Dr. Lindsey B. Payne, Purdue University, West Lafayette

**W206A - Star Tech: Bringing Data Science and Technologies into the Classroom**
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Civil Engineering Division
Moderator: David Saftner, University of Minnesota Duluth

This session includes papers on new ways to bring data science and data technologies into the classroom.

**Integration of Unmanned Aerial Vehicles and Aerial Photogrammetry into a Civil Engineering Course to Enhance Technology Competency**
Mary Kay Camarillo P.E., University of the Pacific
Dr. Elizabeth Basha, University of the Pacific
Mr. Muhammad Saud Khan, University of the Pacific

**Integrating Building Information Modeling (BIM) into the Civil Engineering Curriculum**
Dr. Edwin R. Schmeckpeper P.E., Norwich University
Dr. Nadia Al-Aubaidy, Norwich University

**Preliminary Results from Implementing a Data-driven Team Project in an Introductory Risk and Uncertainty Analysis Class for Sophomore Civil and Environmental Engineering Students**
Dr. Sotiria Koloutsou-Vakakis, University of Illinois at Urbana - Champaign

**Engaging, Data-based, Visual Approach to Explaining Concrete**
Prof. Jinwoo An, University of Mount Union
Mr. Alan M. Hunter, University of Central Florida
Dr. Xi Wang P.E., University of Mount Union
Prof. Boo Hyun Nam, University of Central Florida
Dr. Yong Je Kim, University of Central Florida
Dr. Byoung Hooi Cho, University of Central Florida

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**W206B - Integrating Sustainability and Resilience Concepts into Courses**
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Civil Engineering Division
Moderator: Timothy Wood, The Citadel

This session examines perceptions and teaching practices of sustainability and resilience concepts in civil engineering education.

**Civil Engineering Students’ Beliefs about the Technical and Social Implications of Global Warming and When Global Warming Will Impact Them Personally and Others**
Dr. Andrew Katz, Virginia Tech
Dr. Tripp Shealy, Virginia Polytechnic Institute and State University
Dr. Allison Godwin, Purdue University at West Lafayette

**Integrating the United Nations Sustainable Development Goals and the Envision Rating System to Assess Sustainability in Civil Engineering Capstone Design**
Dr. Leslie R. Brunell P.E., Stevens Institute of Technology (School of Engineering and Science)

**Usage of Building Information Modeling for Sustainable Development Education**
Prof. Benjamin Sanchez, Tecnologico de Monterrey
Prof. Romeo Ballinas-Gonzalez, Tecnologico de Monterrey (ITESM)
Prof. Miguel X. Rodriguez-Paz, Tecnologico de Monterrey (ITESM)
Prof. Juan Arturo Nolazco-Flores, Tecnologico de Monterrey

**Educating Engineers in Coastal Resiliency with a Global Perspective on Climate Change**
Dr. Corinna Marie Fleischmann P.E., U.S. Coast Guard Academy
Dr. Hudson V. Jackson, U.S. Coast Guard Academy
Cmdr. Brian Maggi P.E., U.S. Coast Guard Academy
W207 - College Industry Partnerships Division Technical Session 1
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: College Industry Partnerships Division
Moderators: Patricia Sullivan, New Mexico State University; Charles Baukal, John Zink Co. LLC
Reimagining Engineering Education: Does Industry 4.0 Need Education 4.0?
  Dr. Shuvra Das, University of Detroit Mercy
  Dr. Darrell K. Kleinke P.E., University of Detroit Mercy
  Dr. David Pistrui, University of Detroit Mercy
Preparing Advanced Manufacturing Technicians for the Workplace: Perspectives from Rural Employers
  Dr. Faye R. Jones, Florida State University
  Dr. Marcia A. Mardis, Florida A&M University - Florida State University
Faculty Perceptions of Industry Sponsorships in Capstone Design Courses
  Dr. Jen Symons, University of Portland
  Ms. Kate Rohl, University of Portland

W208 - Computers in Education Division Technical Session 4: Digital Learning Part II
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Computers in Education Division
Moderators: Ashkan Negahban, Pennsylvania State University; Raghu Echempati, Kettering University
Development of a MATLAB/ROS Interface to a Low-cost Robot Arm
  Prof. Robert L. Avanzato, Pennsylvania State University, Abington
Work in Progress: Student Perception of Computer Programming within Engineering Education: An Investigation of Attitudes, Beliefs, and Behaviors
  Dr. Kelly S. Steelman, Michigan Technological University
  Dr. Michelle E. Jarvie-Eggart, Michigan Technological University
  Kay L. Tislar, Michigan Technological University
  Dr. Charles Wallace, Michigan Technological University
  Dr. Nathan D. Manser, Michigan Technological University
  Mrs. Briana C. Bettin, Michigan Technological University
  Leo C. Ureel II, Michigan Technological University
Measuring Students’ Engagement in Learning Volumes of Revolution when Using Advanced Visualization Media in an Active Learning Environment
  Dr. Fadi Castronovo, California State University, East Bay
  Jesus Oliver Ph.D., California State University, East Bay
  Mr. Andrew Stanciulescu, California State University, East Bay
Implementing Serial Communication for the Instructional Processor
  Dr. Ronald J. Hayne, The Citadel
Undergraduate STEM Students’ Role in Making Technology Decisions for Solving Calculus Questions and the Impact of These Decisions on Learning Calculus
  Dr. Emre Tokgoz, Quinnipiac University
  Hasan Alp Tekalp
  Mrs. Elif Naz Tekalp
  Berrak Seren Tekalp BST

W209 - Construction Engineering Division Technical Session 2
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsors: Construction Engineering Division; Architectural Engineering Division
Moderators: Mohamed ELZomor, Florida International University; Kimberly Talley, Texas State University; Norman Philipp, Pittsburg State University; Rachel Mosier, Oklahoma State University
Evaluating the Evolution of Construction Management Students’ Conflict Management Styles as a Result of Andragogical Methods
  Dr. David Wesley Martin, Central Washington University
Evaluation of the Impact of a Summer Construction Camp on Participants’ Perceptions
  Dr. Saeed Rokooei, Mississippi State University
  Dr. Mohammadorsouh Tafazzoli, Washington State University
Integrative Pedagogical Framework to Support Construction Students’ Professional Skills and Engagement
  Mr. Piyush Pradhananga, Florida International University
  Mr. Mohamed ElZomor, Florida International University
  Ms. Gabriella Santi
  Dr. Arif Mohaimin Sadri, Florida International University
The Perspectives of Three Universities’ Building Information Modeling Course Development
  Andrew Richard Klime, California Polytechnic State University, San Luis Obispo
  Dr. Fernanda L. Leite, University of Texas, Austin
Dr. Eduardo Luis Isatto, Universidade Federal do Rio Grande do Sul

Fostering Virtual Reality Environments to Advance Construction and Engineering Students’ Interpersonal Skills
- Mr. Piyush Pradhananga
- Dr. Mohamed ElZomor, Florida International University
- Ms. Gabriella Santi
- Dr. Lu Zhang, Florida International University

Importance of Active Learning in an Undergraduate Course in Construction Scheduling
- Dr. Yewande S. Abraham, Rochester Institute of Technology

W213A - Design Across Curriculum 1
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Design in Engineering Education Division
Moderators: Victoria Bill, NYU Tandon School of Engineering; Robert Loweth, University of Michigan

A New Framework for Student-Led Co-curricular Design Projects
- Miss Nicole Danielle Trenchard, Harvard School of Engineering and Applied Sciences
- Dr. Christopher Lombardo, Harvard School of Engineering and Applied Sciences

Work in Progress: Lessons Learned Supporting First-Year Students in an Academic Maker Space
- Prof. Victoria Bill, NYU Tandon School of Engineering
- Ariane Schoenwiesner, New York University

Student Practices Developing Needs Statements for Design Problems
- Mr. Robert P. Loweth, University of Michigan
- Dr. Shanna R. Daly, University of Michigan
- Jiangqiong Liu
- Prof. Kathleen H. Sienko, University of Michigan

Collaboration Patterns and Design Practices in First-Year Project-Based Engineering
- Ha Nguyen, University of California, Irvine
- Dr. Liang Li Wu, University of California, Irvine
- Dr. Gregory N. Washington, University of California, Irvine
- Prof. Kyu Yon Lim, Ewha Womans University
- Dr. Christian Fischer, University of Tübingen, Germany

A Team Build-Test-Redesign Project in an Engineering Statics Course
- Dr. Xiaobin Le P.E., Wentworth Institute of Technology
- Prof. Richard L. Roberts, Wentworth Institute of Technology
- Dr. Gloria Guohua Ma, Wentworth Institute of Technology
- Mr. Herb Connors, Wentworth Institute of Technology

W213B - Empathy and Human-Centered Design 1
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Design in Engineering Education Division
Moderator: Alexander Pagano

Engineering Design and Social Justice: A Systematized Literature Review
- Mr. Cristian Eduardo Vargas-Ordóñez, Purdue University at West Lafayette
- Dr. Morgan M. Hynes, Purdue University at West Lafayette

Work in Progress: California Challenges in STEM Energy Education through Human-Centered Design Process: A Cooperative Adaptive-Learning Approach to Academic Success for Underserved Students
- Prof. Abbas Ghassemi, University of California, Merced
- Mr. Christopher A. Butler, University of California, Merced

Structure of a Human-Centered and Societal-Based First-Year Maker Space Design Course
- Dr. Pamela L. Dickrell, University of Florida
- Dr. Lilianny Virguez, University of Florida
- Andrea Goncher, University of Florida

W214A - Team Facilitation and Effectiveness
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Educational Research and Methods Division
Moderators: Christine King, University of California, Irvine; James Pembbridge, Embry-Riddle Aeronautical University - Daytona Beach

Team Effectiveness in Predicting Student Learning: An Analysis of First-year Engineering Students
- Dr. P.K. Imbrie, University of Cincinnati
- Ms. Jutshi Agarwal, University of Cincinnati
- Mr. Gibin Raju, University of Cincinnati

Work in Progress: Challenges with Teaming Instruction and Managing Dysfunction
- Dr. Benjamin Emery Mertz, Rose-Hulman Institute of Technology
WEDNESDAY, JUNE 24 SESSIONS

Dr. Ashley Bernal, Rose-Hulman Institute of Technology
Dr. Patrick Cunningham, Rose-Hulman Institute of Technology
Dr. Shraddha Sangelkar, Rose-Hulman Institute of Technology

Cross-functional Team Course Design Project in Engineering
Dr. Nicholas D. Fila, Iowa State University
Dr. Diane T. Rover, Iowa State University
Dr. Mani Mina, Iowa State University
Dr. Phillip H. Jones III, Iowa State University

Effect of Psychological Safety on the Interaction of Students in Teams
Mr. Behzad Beigpourian, Purdue University, West Lafayette
Dr. Matthew W. Ohland, Purdue University, West Lafayette
Dr. Daniel M. Ferguson, Purdue University, West Lafayette

W214B - Data-informed Approaches to Understanding Student Experiences and Outcomes
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Educational Research and Methods Division
Moderators: Arif Mohaimin Sadri, Florida International University; James Pembridge, Embry-Riddle Aeronautical University - Daytona Beach

Learning in Clusters: Exploring the Association Between Noncognitive and Affective Profiles of Engineering Students and Academic Performance
Dr. John Chen, California Polytechnic State University, San Luis Obispo
Jenna Michelle Landy, California Polytechnic State University, San Luis Obispo
Mr. Matthew Scheidt, Purdue University, West Lafayette
Mr. Justin Charles Major, Purdue University, West Lafayette
Ms. Julianna Ge, Purdue University, West Lafayette
Camaryn Elizabeth Chambers, California Polytechnic State University, San Luis Obispo
Christina Grigorian
Michelle Kerfs, California Polytechnic State University, San Luis Obispo
Dr. Edward J. Berger, Purdue University, West Lafayette
Dr. Allison Godwin, Purdue University, West Lafayette
Dr. Brian P. Self, California Polytechnic State University, San Luis Obispo
Dr. James M. Widmann, California Polytechnic State University, San Luis Obispo

Competence, Engineering Achievement, and Persistence
Mr. Harrison Douglas Lawson, Michigan State University
Ms. Amalia Krystal Lira, Michigan State University
Alexandra A. Lee, Michigan State University
Prof. Minhye Lee, Daegu National University of Education
Dr. Lisa Linnenbrink-Garcia, Michigan State University
Prof. S. Patrick Walton, Michigan State University
Dr. Daina Briedis, Michigan State University

A Data-science Approach to Flagging Non-retention in Engineering Enrollment Data
Mariem Boujelbene, University of Louisville
Mr. Khalil Damak, University of Louisville
Asuman Cagla Acun Sener, University of Louisville
Dr. Jeffrey Lloyd Hieb, University of Louisville
Dr. Campbell R. Bego, University of Louisville
Dr. Patricia A. Ralston, University of Louisville
Prof. Olfa Nasraoui, University of Louisville

Examining STEM Diagnostic Exam Scores and Self-efficacy as Predictors of Three-year STEM Psychological and Career Outcomes
Ms. Brittany C. Bradford, Rice University
Dr. Margaret E. Beier, Rice University
Ms. Megan McSpedon, Rice University
Prof. Michael Wolf, Rice University

Unleashing the Power of Data Analytics to Examine Engineering Students’ Experiences and Outcomes
Dr. Qin Liu, University of Toronto
Dr. Greg Evans, University of Toronto

W215 - Improvements in ECE Circuit Analysis
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Electrical and Computer Division
Moderators: Jennifer Bonniwell, Milwaukee School of Engineering; Huihui Wang, Jacksonville University

Systematic Review of Rigorous Research in Teaching Introductory Circuits
Mr. Tom Henry J. Reagan, Colorado School of Mines
Dr. Stephanie Claussen, Colorado School of Mines
Mr. Eric Lyne

Understanding Potential Misconceptions Shared Between Instructors and Students in Fundamental Electric Circuits
Mr. Alejandro H. Espera Jr., Virginia Polytechnic Institute & State University
ASEE'S VIRTUAL CONFERENCE
WEDNESDAY, JUNE 24 SESSIONS

Dr. Nicole P. Pitterson, Virginia Polytechnic Institute & State University
Ing. René Alexander Soto-Pérez, Purdue University, West Lafayette

Turning Mesh Analysis Inside Out
Dr. Brian J. Skromme, Arizona State University
Wendy M. Barnard, Arizona State University
Mary White

Work in Progress: Investigating Students’ Meta-cognitive Awareness of Their Misconceptions About Electric Circuits
Dr. Kun Yao, University of Georgia
Dr. Adel W. Al Weshah, University of Georgia
Dr. Nathaniel Hunsu, University of Georgia

Helping Students Write It Right: Instilling Good Report-writing Habits in a Linear Circuit Lab Course
Dr. Eva Cosoroaba, University of Vermont

W216 - ECCD Technical Session 4: Energy and Analysis
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Energy Conversion and Conservation Division
Moderators: Matt Aldeman, Illinois State University; Sandip Das, Kennesaw State University

Papers presented in this session are related to energy and analysis, and their educational aspects.

A Comparison of the Renewable Energy and Energy Storage Sectors in Germany and the United States, with Recommendations for Engineering Teaching Practices
Dr. Lisa Bosman, Purdue University, West Lafayette
Jennifer Brinker, Northeast Wisconsin Technical College
Dr. Kenneth Walz, Madison Area Technical College

Relationship of the Industrial Assessment Center to the Land-grant Mission of Oklahoma State University
Dr. Hitesh D. Vora, Oklahoma State University
Ms. Pragya Niraula, Oklahoma State University
Amrit Sunil Chugani, Oklahoma State University
Mr. Nilesh Anil Baraskar, Oklahoma State University
Anusha Sunil Saraf, Oklahoma State University
Dr. Michael L. McCombs, Oklahoma State University

An Evaluation of Focused Outreach and Recruiting Efforts in a Nuclear-related Workforce Development Program
Dr. Hayrettin B. Karayaka, Western Carolina University
Dr. Chip W. Ferguson, Western Carolina University
Dr. Amber C. Thompson, Western Carolina University

Analysis and Field-based Learning of Energy Conservation Measures in an Engineering Thermodynamics Course
Dr. Arash Kialashaki, California State University, Chico

W217 - Engineering and Public Policy Division Technical Session 1
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering and Public Policy Division
Moderator: Deanna Matthews, Carnegie Mellon University

Factors Influencing the Performance of Scientific and Technological Innovation in Chinese Universities: Evidence from fsQCA
Dr. Xiangyu Zhou, Zhejiang University
Dr. Lina Wei, Zhejiang University
Prof. Wei Zhang, Zhejiang University

A Statewide Policy-driven Approach to Gender Equity
Dr. Andrea E. Surovek, South Dakota School of Mines and Technology
Dr. Andrea Lyn Liebl, University of South Dakota
Dr. Alyssa M. Kiesow, Northern State University
Dr. Mary Emery
Dr. Pam F. Rowland
Dr. Cynthia Anderson

W220 - Ethical Reasoning and Decision Making
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Ethics Division
Moderators: Alexa Rihana Abdallah, University of Detroit Mercy; Joshua Gargac, University of Mount Union

Ethical Reasoning and Moral Foundations Among Engineering Students in China
Dr. Rockwell Franklin Clancy III, University of Michigan-Shanghai Jiao Tong University Joint Institute

Work in Progress: How Should We Decide? The Application of Ethical Reasoning to Decision Making in Difficult Cases
Mrs. Natalie C.T. Van Tyne P.E., Virginia Tech

Piloting an Adaptive Ethical Decision-making Tool for Engineering Students
Dr. Vignesh Subbian, University of Arizona
Dr. Linda R. Shaw, University of Arizona
ASEE'S VIRTUAL CONFERENCE
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W221 - Professional Issues and Opportunities for Engineering Librarians
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Libraries Division
Moderators: Emily Hart, Syracuse University; Marcus Spann, Louisiana State University and A&M College

ETAC ABET Accreditation and Information Literacy: A Case Study of Mechanical Engineering Technology
Mr. Michael Fosmire, Purdue University, West Lafayette

Assessing an Assessment: A Case Study of the NSSE “Experiences with Information Literacy” Module
Ms. Debbie Morrow, Grand Valley State University

Recent Changes to the Fundamentals of Engineering (FE) Exam and Ways Engineering Libraries Can Support Students
Ms. Jean L. Bossart, University of Florida

Diversity, Equity, and Inclusion Teaching Practices Among Engineering Librarians
Sarah E. Lester, California Polytechnic State University, San Luis Obispo

An Examination of Systematic Reviews in the Engineering Literature
Ms. Alison Henry, University of Alberta
Ms. Lauren Stiegeltz, University of Alberta

W222 - Engineering Management Division 1: The Practice of EMD
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Management Division
Moderator: Christopher Rowe, Vanderbilt University

Papers related to the professional practice of engineering management and how such concepts could be presented in the classroom.

Career Paths in Structural Engineering: What We Can Learn from the SE3 (Structural Engineering Engagement and Equity) Report
Prof. Christina McCoy P.E., Oklahoma State University
Prof. Carisa H. Ramming, Oklahoma State University

The Effect of Different Dimensions of Conflict on Measures of Team-member Effectiveness
Mr. Lawrence M. Stenger, CATME
Mr. Behzad Beigpourian, Purdue University, West Lafayette
Dr. Matthew W. Ohland, Purdue University, West Lafayette
Dr. Daniel M. Ferguson, Purdue University, West Lafayette

A Simple Model for Identifying Costs of Quality
Dr. Mustafa Shraim, Ohio University

W225 - Inventive Opportunities for Research and Exposure
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Environmental Engineering Division
Moderators: Patricia Hogan, Suffolk University; Veera Gnaneswar Gude, Mississippi State University; Rachel Brennan, Pennsylvania State University

Developing a Multicampus Model for REU Sites
Dr. Pamela McLeod, ReNUWIt at Stanford University
Dr. Junko Munakata Marr, Colorado School of Mines
Prof. Richard G. Luthy, Stanford University

Environmental and Ecological Engineering in Context: A Foundational Graduate Course
Dr. Inez Hua, Purdue University, West Lafayette
Dr. Loring Nies, Purdue University, West Lafayette
Dr. Lindsey B. Payne, Purdue University, West Lafayette

W226 - Experimentation and Laboratory-oriented Studies Division Technical Session 3
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Experimentation and Laboratory-Oriented Studies Division
Moderator: Nebojsa Jaksic, Colorado State University - Pueblo

A Survey of the Proportion of Classes in Undergraduate Engineering Curricula that Include Labs
Eleanor Byrnes, Harvey Mudd College
Yaqub Alam Mahsud, Harvey Mudd College
Spencer Rosen, Harvey Mudd College
Matthew Spencer, Harvey Mudd College

Oklahoma State University’s ENDEAVOR: Transformation of Undergraduate Engineering Education Through Experience-based Learning.
Dr. Hitesh D. Vora, Oklahoma State University
Dr. Brad Rowland, Oklahoma State University
Dr. Joe Conner, Oklahoma State University
Prof. Brian K. Norton P.E., Oklahoma State University
Dr. Qinang Hu, Oklahoma State University
Dr. Toni Ivey, Oklahoma State University

Developing Best Practices for Teaching Scientific Documentation: Toward a Better Understanding of How Lab Notebooks Contribute to Knowledge-building in Engineering Design and Experimentation
Dr. Rick Evans, Cornell University
Prof. Jeffrey Moses, Cornell University
Dr. Traci M. Nathans-Kelly, Cornell University

**Perspectives and Practices of Undergraduate/Graduate Teaching Assistants on Writing Pedagogical Knowledge and Lab Report Evaluation in Engineering Laboratory Courses**
Dr. Dave Kim, Washington State University, Vancouver
Dr. John D. Lynch, Washington State University, Vancouver

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**W227 - The Best of First-year Programs Division**

10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: First-Year Programs Division
Moderators: Kaitlin Mallouk, Rowan University; Timothy Hinds, Michigan State University

This will be a "best-of" session, so we expect a higher headcount than normal.

**Predictors of First-year Retention Among Undergraduate Engineering Students Who Earn a C in their First-semester Math Course**
Dr. Campbell R. Bego, University of Louisville
Dr. Jason Immekus, University of Louisville
Dr. Jeffrey Lloyd Hieb, University of Louisville

**Information-seeking Behavior Among First-year Engineering Students and the Impacts of Pedagogical Intervention**
Dr. George James Lamont, University of Waterloo
Dr. Kari D. Weaver, University of Waterloo
Mrs. Rachel Figueiredo, University of Waterloo
Dr. Kate Mercer, University of Waterloo
Dr. Andrea Jonahs, University of Waterloo
Dr. Heather A. Love, University of Waterloo
Dr. Brad Mehlenbacher, University of Waterloo
Carter Neal, University of Waterloo
Dr. Katherine Zmetana, University of Waterloo
Dr. Rania Al-Hammoud P.Eng., University of Waterloo

**Do Open-ended Design Projects Motivate First-year Engineering Students?**
Dr. Chao Wang, Arizona State University

**An Autoethnography: Outcomes from Faculty Engagement in Course Development in a Large First-year Engineering Program**
Dr. Holly M. Matusovich, Virginia Polytechnic Institute and State University
Dr. Homero Murzi, Virginia Polytechnic Institute and State University
Dr. David Gray, Virginia Polytechnic Institute and State University

Dr. Benjamin D. Chambers, Virginia Polytechnic Institute and State University
Matthew B. James, Virginia Polytechnic Institute and State University

**Continuing to Promote Metacognitive Awareness in a First-year Learning Strategies Course**
Dr. Elizabeth Anne Stephan, Clemson University
Ms. Abigail T. Stephan, Clemson University
Laurel Whisler, Clemson University

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**W231 - Instrumentation Division Technical Session 2**

10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Instrumentation Division
Moderator: Ali Alavizadeh, Purdue University Northwest

**Credential Harvesting Using Raspberry Pi**
Dr. Tae-Hoon Kim, Purdue University Northwest
Dr. Ge Jin, Purdue University Northwest
Dr. Michael Tu, Purdue University Northwest
Mr. Tianyang Guan, Purdue University Northwest

**The Impact Detector Project: Mechanical and Electrical Worlds Collide**
Dr. Dale H. Litwhiler, Pennsylvania State University, Berks Campus

**Applied Instrumentation Course for Undergraduate Thermal-fluid Sciences**
Dr. Elliott Bryner, Embry-Riddle Aeronautical University
Dr. Daniel Dannelley, Embry-Riddle Aeronautical University, Prescott

**Fundamental Instrumentation Course for Undergraduate Aerospace and Mechanical Engineering**
Dr. Daniel Dannelley, Embry-Riddle Aeronautical University, Prescott
Dr. Elliott Bryner, Embry-Riddle Aeronautical University

**Design and Development of Robust Portable Trainers Used in PLC and Pneumatic Laboratories**
Dr. Ali Alavizadeh, Purdue University Northwest
Dr. Maged Mikhail, Purdue University Northwest

**Metering and Data Acquisition System for Electrical Gateway**
Dr. Herbert L. Hess, University of Idaho, Moscow
W232 - International Accreditation and Credentials: International Division Technical Session 1
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: International Division
Moderators: Siben Dasgupta, Wentworth Institute of Technology; Phillip Sanger, Purdue University at West Lafayette

This session includes issues regarding accreditation and credentials outside of the U.S.

Achievements, Issues, and Recommendations of Quality Assurance in Engineering Education Within Colleges and Universities in Mainland China Under the Background of Program Accreditation
Dr. Ming Li, Beijing Foreign Studies University

Developments in Professional Engineering License Mobility and Recognition of International Credentials
Dr. Carmine C. Balascio P.E., University of Delaware

Outcome-based (Engineering) Education (OBE): International Accreditation Practices
Prof. Junaid Qadir, Information Technology University, Lahore, Pakistan
Dr. Aamir Shafi, National University of Computing and Emerging Sciences, Lahore, Pakistan
Prof. Ala Al-Fuqaha, Hamad Bin Khalifa University
Dr. Abd-Elhamid M. Taha, Alfaisal University
Prof. Kok-Lim Alvin Yau, Sunway University
Dr. Ing. João Ponciano, University of Glasgow
Dr. Sajjad Hussain, University of Glasgow
Prof. Muhammad Ali Imran P.E., University of Glasgow
Prof. Sajid Sheikh Muhammad, National University of Computer and Emerging Sciences, Lahore, Pakistan
Dr. Rao Naveed Bin Rais, Ajman University, UAE
Dr. Muhammad Rashid, Umm Al Qura University
Dr. Boon Leing Tan, Xi'an International University

W234 - Promoting Communication Skills
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Liberal Education/Engineering & Society Division
Moderator: Robin Fowler, University of Michigan

Communication Across Divisions: Trends Emerging from the 2019 Annual Conference of ASEE and Some Possibilities for Strategic Action
Dr. Kathryn A. Neeley, University of Virginia
Dr. Judith Shaul Norback, Georgia Institute of Technology
Mr. Charlie Bennett, Georgia Institute of Technology
Dr. Benjamin J. Laugelli, University of Virginia

Quantitative Assessment of Students’ Revision Processes
Lisa R. Volpatti, Massachusetts Institute of Technology
Mr. Alex Jordan Hanson, University of Texas at Austin
Jennifer M. Schall
Dr. Benjamin J. Laugelli, University of Virginia

Implementing Writing-as-Process in Engineering Education
Bruce Kovanen, University of Illinois at Urbana-Champaign
Ryan Ware, University of Illinois at Urbana-Champaign
Megan Mericle, University of Illinois at Urbana-Champaign
Nicole Turnipseed, University of Illinois at Urbana-Champaign
J. Patrick Coleman, University of Illinois at Urbana-Champaign
Celia Mathews Elliott, University of Illinois at Urbana-Champaign
Prof. John S. Popovics, University of Illinois at Urbana-Champaign
Prof. S. Lance Cooper, University of Illinois at Urbana-Champaign
Dr. John R. Gallagher, University of Illinois at Urbana-Champaign
Dr. John R. Gallagher, University of Illinois at Urbana-Champaign
Prof. Paul Prior, University of Illinois at Urbana-Champaign
Julie L. Zilles, University of Illinois at Urbana-Champaign

The Places They Will Go: What Happens When Engineering Students Critically Reflect
Ms. Gabrielle Orbaek White, Swansea University
Dr. Patricia Xavier, Swansea University
Dr. Catherine Groves, Swansea University
**ASEE’S VIRTUAL CONFERENCE**  
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### W235 - Undergraduate Research and Industry  
**10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE**  
**Sponsor: Manufacturing Division**  
**Moderator: Richard Chiou, Drexel University**  
Interdisciplinary Senior Design Project to Develop a Personal Blind Spot Information System  
Dr. Yalcin Ertekin, Drexel University  
Dr. Irina Nicoleta Ciobanescu Husan, Drexel University  
Mr. Mike Stine Jr.  
Mr. Douglas Brian Forbes, Lockheed Martin  
Mr. Benjamin Cohen  
Ryan Buckley  

Investing in the Future: Bringing Research and Industry into Simulation-based Manufacturing Education  
Dr. Faisal Aqlan, Pennsylvania State University  
Dr. Qi Dunsworth, Pennsylvania State University  
Dr. Jessica Resig  

Undergraduate Research: Experimental Study on Performance of Marine Propellers  
Dr. Jahangir Ansari, Virginia State University

### W237 - Mathematics Division  
**Technical Session 2: Presentations**  
**10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE**  
**Sponsor: Mathematics Division**  
**Moderator: Amitabha Ghosh, Rochester Institute of Technology (COE)**  

On the Effectiveness of Designing Didactical Situations Targeting $\mathbb{R}^n$ to Teach the Concept of Subspace in Linear Algebra  
Dr. Anibal Sosa, Universidad Icesi, Colombia  
Dr. Norha M. Villegas, Universidad Icesi, Colombia  
Mrs. Stephanie Celis Gallego, Universidad Icesi, Colombia  
Mr. Diego Antonio Bohórquez, Universidad Icesi, Colombia  

Mathematics Content of an Undergraduate Course on Deep Learning  
Prof. Yosi Shibberu, Rose-Hulman Institute of Technology  

Using Time-based Experiences for Explaining the Concept of Discontinuity  
Dr. Daniel Raviv, Florida Atlantic University  

Math of OK Go  
MiKyla Jean Harjamaki, Playful Learning Lab  
Dr. AnnMarie Thomas, University of St. Thomas  
Ms. Krista Schumacher, University of St. Thomas

### W271 - NSF Grantees: Learning Tools (Hands On)  
**10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE**  
**Sponsor: NSF Grantees Session**  
**Moderators: Amber Genau, University of Alabama at Birmingham; Hua Li, Texas A&M University - Kingsville**  

Presentations from groups with current NSF-funded projects focused on the development of hands-on models for classroom use.  

**Development of Team-Based Hands-On Learning Experiences**  
Dr. Aldo A. Ferri, Georgia Institute of Technology  
Dr. James I. Craig, Georgia Institute of Technology  
Dr. Bonnie H. Ferri, Georgia Institute of Technology  
Dr. Meltem Alemdar, Georgia Institute of Technology  
Benjamin Klein, Georgia Institute of Technology  

**Engaging STEM Learners with Hands-on Models to Build Representational Competence**  
Eric Davishahl, Whatcom Community College  
Dr. Lee W. Singleton, Whatcom Community College  
Todd Haskell, Western Washington University  

**Development of a Multiscale Experimentation and Visualization Module for Undergraduate Mechanics Education**  
Mr. Blake Herren, University of Oklahoma  
Nyree Mason  
Dr. Firas Akasheh, Tuskegee University  
Dr. Gül E. Okudan-Kremer, Iowa State University of Science and Technology  
Prof. Zahed Siddique, University of Oklahoma  
Prof. Yingtao Liu, University of Oklahoma  

**A First-year Progress Report on "Collaborative Research Using Low-cost Desktop Learning Modules to Educate Diverse Undergraduate Communities in Engineering"**  
Katelyn Dahlke, University of Wisconsin - Madison  
Kitana Kaiphanliam, Washington State University  
Prof. Bernard J. Van Wie, Washington State University  
David B. Thiessen, Washington State University  
Dr. Prashanta Dutta, Washington State University

Abby Bensen, University of St. Thomas  
Ms. Emma Michelle Monson, University of St. Thomas  
Improving STEM Education by Analyzing the Design of a Bottle  
Alexander Henderson, San Jose State University  
Alexander Garcia, San Jose State University

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ASEE’S VIRTUAL CONFERENCE
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W271B - NSF Grantees: Learning Tools (Virtual)
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: NSF Grantees Session
Moderator: Renata Revelo, The University of Illinois at Chicago

Presentations from groups with current NSF-funded projects focused on the development of virtual or online learning tools, particularly for visualization.

Development, Deployment, and Evaluation of Instructional Modules for Current and Future Practitioners of Model-based Systems Engineering
Dr. Audeen W. Fentiman, Purdue University
Ms. Tianian Li, Purdue University at West Lafayette
Prof. Ali Khalid Raz, Purdue University at West Lafayette
Dr. Kerrie A. Douglas, Purdue University at West Lafayette
Prof. John W. Sutherland, Purdue University at West Lafayette
Dr. Jorge D. Camba, Purdue University at West Lafayette
Daniel DeLaurentis, Purdue University at West Lafayette

Collaborative Research: Designing an Immersive Virtual Environment for Chemical Engineering Process Safety Training
Dr. Daniel D. Anastasio, Rose-Hulman Institute of Technology
Landon Bassett, University of Connecticut
Jeffrey Stransky, Rowan University
Dr. Cheryl A. Bodnar, Rowan University
Dr. Daniel D. Burkey, University of Connecticut
Dr. Matthew Cooper, North Carolina State University

Spatial Visualization Skills Training at Texas State University to Enhance STEM Students’ Academic Success
Dr. Clara Novoa, Texas State University
Dr. Bobbi J. Spencer, Texas State University
Ms. Leona Hazeledwood, Texas State University
Dr. Araceli Martinez Ortiz, Texas State University

A Random Forest Model for Personalized Learning in a Narrative Game
Dr. Ying Tang, Rowan University
Mr. Ryan Hare, Rowan University

W299A - SPONSOR TECHNICAL SESSION: Integrating Coordinate Metrology into Engineering Programs - Presented by ZEISS Industrial Quality Solutions
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Sponsored Sessions
Moderator: Lauren Van Beek, ZEISS Industrial Quality Solutions
Speaker: Lauren Van Beek, Academic Program Manager, ZEISS Industrial Quality Solutions

Join the ZEISS academic program team in a discussion of how using coordinate measuring machines in educational institutions can help engineering students understand the importance of quality control in manufacturing. Presentation includes an overview of the need for metrology education for an advanced manufacturing workforce, a demonstration of ZEISS CMM equipment and software, and an overview of the special packages ZEISS offers to educational institutions.

W299B - SPONSOR TECHNICAL SESSION: Presented by MSC Software
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Sponsored Sessions

W304A - Design in Biomedical Engineering (Works in Progress)
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Biomedical Engineering Division
Moderators: Brian Helmke, University of Virginia; Dianne Hendricks, University of Washington

WIP: Experiential, Interdisciplinary Course in Global Health Innovation and Entrepreneurship
Dr. Katherine E. Reuther, Columbia University
Ms. Rachel Diane Field, Columbia University
Dr. Aaron Kyle, Columbia University

Design-thinking Concepts in Undergraduate Engineering Capstone Projects
Mr. Michael A. Phelan, Temple University
Mr. Aratrik Guha
Mr. Brandon K. Harrison, Temple University
George Moukarzel, Temple University
Ms. Abigail A. Tetteh
Dr. Yah-el Har-el, Temple University

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ASEE’S VIRTUAL CONFERENCE
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Dr. Ruth Ochia P.E., Temple University
Inclusion of Industry Professional Experts in Biomedical Engineering Design Courses At-scale
Collin W. Shale, Johns Hopkins University
Miss Shababa Binte Matin, Johns Hopkins University
Mr. Nicholas J. Durr, Johns Hopkins University
Elizabeth A. Logsdon, Johns Hopkins University

WIP: Engineering and Industrial Design Sub-teams for a Multi-disciplinary Biomedical Engineering Design Course
Ms. Erica M. Comber, Carnegie Mellon University
Mr. Elisha Anthony Raeker-Jordan, Carnegie Mellon University
Mrs. Kalliope Georgette Roberts, Carnegie Mellon University
Ms. Melanie Alexis Loppnow, Carnegie Mellon University
Mr. Andrew Hudson, Carnegie Mellon University
Prof. Wayne Chung, Carnegie Mellon University
Dr. Conrad M. Zapanta, Carnegie Mellon University

WIP: Transdisciplinary Design Education in Biomedical Engineering and Industrial Design Towards Identifying Unmet Needs of U.S. Veterans and their Healthcare Teams
Dr. Christopher Arena, Virginia Polytechnic Institute and State University
Dr. Elham Morshedzadeh, Virginia Polytechnic Institute and State University
Dr. John L. Robertson, Virginia Polytechnic Institute and State University
Dr. Andre Albert Muelenaer, Virginia Polytechnic Institute and State University
Brad D. Hendershot, DoD-VA Extremity Trauma and Amputation Center of Excellence, Walter Reed National Military Medical Center
Dr. Jessica L. O’Leary, Salem VA Medical Center
Dr. Aliza M. Lee, U.S. Department of Veterans Affairs
Dr. Devasmita Choudhury
Mr. Brandon C. Briggs
Dr. Pamela Jean VandeVord, Virginia Polytechnic Institute and State University

Redesigning a Biomedical Engineering Capstone Design Sequence to Enhance Student Engagement
Dr. Olga Imas, Milwaukee School of Engineering
Dr. Jeffrey A. LaMack, Milwaukee School of Engineering
Dr. Icaro Dos Santos, Milwaukee School of Engineering
Dr. Larry Fennigkoh P.E., Milwaukee School of Engineering
Dr. Charles S. Tritt, Milwaukee School of Engineering

W304B - Laboratory Learning in Biomedical Engineering (Works in Progress)
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Biomedical Engineering Division
Moderators: Jennifer Choi, University of California, Davis; Rachael Schmedlen, University of Michigan

WIP: Comparison of a Standards-based Assessment to a Traditional, Summative Rubric in a Biomedical Engineering Laboratory
Dr. Casey Jane Ankeny, Northwestern University
Prof. David P. O’Neill, Northwestern University
Lisa Beckmann, Northwestern University

WIP: Lab Benchmarking: How Are We Using Lab Courses in BME Curricula?
Michael P. Rathslag, University of Illinois, Urbana-Champaign
Miss Brittany R. Van Vleet, University of Illinois, Urbana-Champaign
Dr. Jennifer R. Amos, University of Illinois, Urbana-Champaign
Prof. Karin Jensen, University of Illinois, Urbana-Champaign

WIP: Interfacing with Microcontrollers: An Online Laboratory Learning Experience
Dr. Scott Howard Seidman, University of Rochester

WIP: Utilizing Guided Worksheets to Address Gender Gap in Troubleshooting Laboratory Course
Sabia Zehra Abidi, Rice University
Dr. Renata Fortuna Ramos, Rice University

Gamification and the use of “FPS,” or First-person Shooting/”Seeding” Perspective in a Laboratory Course
Dr. Sarah Corinne Rowlinson, University of Florida

WIP: Pilot Study for the Effect of Simulated Laboratories on the Motivation of Biological Engineering Students
Mr. Ryan P. Devine, University of Georgia
Dr. Dominik May, University of Georgia
Dr. Cheryl T. Gomillion, University of Georgia
# ASEE’S VIRTUAL CONFERENCE

**W305A - Chemical Engineering in the Sophomore Year**

**10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE**

**Sponsor: Chemical Engineering Division**

**Moderators: Katie Cadwell, Syracuse University; Justin Shaffer, Colorado School of Mines**

**Student Attitudes When Solving Homework Problems that Reverse Engineer YouTube Videos**

Uchenna Asogwa, University of Toledo  
Prof. Matthew W. Liberatore, University of Toledo  
Mr. Timothy Ryan Duckett, University of Toledo  
Dr. Gale A. Mentzer, Acumen Research and Evaluation, LLC

**Creating and Facilitating Engaging, Rigorous Fully-Online Technical Courses (or just Online Content for Face-to-Face Courses) - an MEB Example**

Dr. Tracy Q. Gardner, Colorado School of Mines

**Evaluating a New Second-year Introduction to Chemical Engineering Design Course Using Concept Mapping**

Matheus Oliveira Cassol, University of British Columbia, Vancouver  
Dr. Jonathan Verrett, University of British Columbia, Vancouver

**Quantifying Success and Attempts on Auto-graded Homework when Using an Interactive Textbook**

Prof. Matthew W. Liberatore, University of Toledo  
Megan Davidson, University of Toledo  
Kayla Chapman

**Student Performance in an Online Chemical Engineering Thermodynamics Course on a Summer Schedule**

Dr. David L. Silverstein P.E., University of Kentucky  
Dr. Sarah A. Wilson, University of Kentucky

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**W305B - Chemical Engineering in the Junior and Senior Year**

**11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE**

**Sponsor: Chemical Engineering Division**

**Moderators: Cheryl Bodnar, Rowan University; Jason White, University of California, Davis**

**Process Control Design and Practice – A New Approach to Teaching Control to Chemical Engineers**

Dr. Thomas Andrew Meadowcroft, Rowan University

**Using Incident Reporting to Integrate Hazard Analysis and Risk Assessment into the Unit Operations Lab**

Dr. Sarah A Wilson, University of Kentucky  
Prof. Samira M. Azarin Azarin, University of Minnesota  
Dr. Christopher Barr, University of Michigan

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**W306A - Making it Sticky: Ways to Reinforce Prerequisite Knowledge**

**11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE**

**Sponsor: Civil Engineering Division**

**Moderator: Leslie Brunell, Stevens Institute of Technology (School of Engineering and Science)**

This session includes papers describing approaches to help students recall or reinforce pre-requisite knowledge.

**Making Connections: Ensuring Strength of the Civil Engineering Curriculum**


**Personalized Learning Plans for Prerequisite Materials in a Senior-level Traffic Engineering Course**

Dr. Vikash Gayah, Pennsylvania State University  
Dr. Sarah E. Zappe, Pennsylvania State University  
Dr. Stephanie Cutler, Pennsylvania State University

**A Comparative Analysis of the Students’ Performance in Two Statics Courses Due to the Inclusion of an Adaptive Learning Module (ALM) to Review the Mathematics Prerequisite Knowledge**

Dr. Ricardo Zaurin PE, University of Central Florida  
Sudipta Dey Tirtha, University of Central Florida  
Prof. Naveen Eluru, University of Central Florida
Using Case Studies and Educational Technology to Teach Structural Analysis and Design to Construction Engineering and Management Undergraduates

Dr. Monique H. Head, University of Delaware
Dr. Allen A. Jayne P.E., University of Delaware
Dr. Kevin R. Guidry, University of Delaware

W306B - Flipped, Blended, Online, Oh My
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Civil Engineering Division
Moderator: Matthew Lovell, Rose-Hulman Institute of Technology

This session includes papers on approaches to deliver courses using online learning approaches and tools.

A Comparison between Mixed-Mode and Face-to-Face Instructional Delivery Approaches for Engineering Analysis: Statics

Dr. Ricardo Zaurin PE, University of Central Florida
Sudipta Dey Tirtha, University of Central Florida
Prof. Naveen Eluru, University of Central Florida

Design, Implementation, and Evaluation of an Online Computer Course for Engineering Problem Solving

Dr. Cora Martinez, Florida International University, Department of Civil and Environmental Engineering
Dr. Lili Steiner, Florida International University

Highlights and Lessons Learned from a Partially Flipped Civil Engineering Classroom Study

Dr. Kimberly Warren, University of North Carolina at Charlotte
Meagan Padro, University of North Carolina at Charlotte
Dr. Chuang Wang, University of Macau

The Evaluation of Different Learning Tools in Flipped Mechanics of Materials

Dr. Sarira Motaref P.E., University of Connecticut

W307 - College Industry Partnerships Division Technical Session 2
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: College Industry Partnerships Division
Moderators: Magdalini Lagoudas, Texas A&M University; Charles Baukal, John Zink Co. LLC

The Industry 4.0 Talent Pipeline: A Generational Overview of the Professional Competencies, Motivational Factors, and Behavioral Styles of the Workforce

Dr. David Pistrui, University of Detroit Mercy
Dr. Darrell K. Kleinke P.E., University of Detroit Mercy
Dr. Shuvra Das, University of Detroit Mercy
Dr. Ronald Bonnstetter, Target Training International
Dr. Eric T. Gehrig, Target Training International

The Status of University-Industry Collaboration in China, the E.U., and the U.S.—A Comparative Research on Co-authored Publications

Dr. Tuoyu Li, Zhejiang University
Miss Zicong Zhao, Zhejiang University
Dr. Yujie Wang, Zhejiang University
Dr. Chen Li, Zhejiang University

W308A - Computers in Education Division Technical Session 5: Online Teaching and Learning
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Computers in Education Division
Moderators: Mahmoud Quweider, The University of Texas Rio Grande Valley; Stephen Edwards, Virginia Polytechnic Institute and State University

This session will include papers on digital learning.

A Multi-year Case Study in Blended Design: Student Experiences in a Blended, Synchronous, Distance Controls Course

Prof. Alisa Gilmore P.E., University of Nebraska, Lincoln
Dr. Tareq Daher, University of Nebraska, Lincoln
Dr. Markeya S. Peteranetz, University of Nebraska, Lincoln

"Keep Your Eyes on Your Own Paper" - Academic Dishonesty in the Era of Online Homework Assistance

Dr. Kenneth Reid, Virginia Tech
Max Mikel-Stites, Virginia Tech

Student and Faculty Perceptions of Integrated E-learning Modules Aimed at Developing an Entrepreneurial Mindset

Dr. Maria-Isabel Carnasciali, University of New Haven
Dr. Nadiye O. Erdil, University of New Haven
Dr. Ronald S. Harichandran, University of New Haven
Dr. Jean Nocito-Gobel, University of New Haven
Dr. Cheryl Q. Li, University of New Haven

Experiences in Developing a Robust Popular Online CS1 Course for the Past Seven Years

Joe Michael Allen, University of California, Riverside
Prof. Frank Vahid, University of California, Riverside

Schedule subject to change. Please go to www.asee20.pathable.co for up-to-date information
W308B - Computers in Education Division Technical Session 6: Computer Science Freshman Courses

11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Computers in Education Division

Moderators: Fitratullah Khan, University of Texas Rio Grande Valley; Emre Tokgoz, Quinnipiac University

This session will highlight COED papers related to teaching Computer Science I and II courses.

Teaching Coral before C++ in a CS1 Course
Joe Michael Allen, University of California, Riverside
Prof. Frank Vahid, University of California, Riverside

Analyzing Pivoting Among Weekly Many Small Programs in a CS1 Course
Joe Michael Allen, University of California, Riverside
Prof. Frank Vahid, University of California, Riverside

Improving Pass Rates by Switching from a Passive to an Active Learning Textbook in CS0
Ms. Dawn McKinney, University of South Alabama
Dr. Alex Daniel Edgcomb, Zybooks
Prof. Roman Lysecky, University of Arizona
Prof. Frank Vahid, University of California, Riverside

Effectiveness of Using Guided Peer Code Review to Support Learning of Programming Concepts in a CS2 Course: A Pilot Study
Dr. Tamaike Brown, State University of New York at Oswego
Dr. Gursimran Singh Walia, Georgia Southern University
Mr. Alex David Walia, North Dakota State University
Dr. Maninder Singh, St. Cloud State University
Dr. Mourya Reddy Narasaredygari, Rider University

W311 - Cooperative and Experiential Education Division Technical Session 1 - Skill and Competency Development through the Co-op Experience

11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Cooperative and Experiential Education Division

Moderators: Katherine McConnel, University of Colorado Boulder; Mary Andrade, University of Louisville

This session will provide a best-practices overview for skill and competency development through the co-op experience. This live (synchronous delivery) session will include a brief overview from each presenter, followed by an interactive question-and-answer session that allows for focused audience engagement. Before participating in this session, it is advised that the online technical session content (pre-recorded, asynchronous delivery) be reviewed.

Understanding How Co-op Students View their Learning
Ms. Katherine M. Ehlert, Clemson University
Dr. Marisa K. Orr, Clemson University

Co-op Education and the Impact on the Behaviors and Competencies of Undergraduate Engineering Students
Dr. Nassif E. Rayess, University of Detroit Mercy
Dr. David Pistrui, University of Detroit Mercy
Dr. Ron Bonnstetter, Target Training International
Dr. Eric T. Gehrig, Target Training International

Linking Co-op and Senior Project: Technical Proposal Requirement Embedded in Second Co-op Rotation
Dr. Lindsay Corneal, Grand Valley State University
Dr. Wendy S. Raffeeor, Grand Valley State University
Dr. Christopher P. Pung P.E., Grand Valley State University

Development of Employability Skills in Engineering Disciplines through Co-op
Ms. Haaniyah Ali, York University
Dr. Jeffrey Harris, York University

W313A - Design Across the Curriculum 2

11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Design in Engineering Education Division

Moderators: Charlotte de Vries, Pennsylvania State University, Behrend College; Lilianny Virguez, University of Florida

The Implementation of Dynamic Learning in a Project-based Introductory Engineering Course
Mr. Johnathon Garcia, New Mexico Institute of Mining and Technology
Ryan E. Harlow, New Mexico Institute of Mining and Technology
Estevan Andres Nunez, New Mexico Institute of Mining and Technology
Miss Lorena Isabel Velasquez, New Mexico Institute of Mining and Technology
Dr. Curtis John O’Malley, New Mexico Institute of Mining and Technology

Development of a Mentorship Program between Upper-class and First-year Engineering Students through 3-D Printing
Dr. Charlotte Marr de Vries, Pennsylvania State University, Behrend College
Prof. Jill Johnson P.E., Pennsylvania State University, Behrend College
Mr. Brian Lani

**Utility Value of an Introductory Engineering Design Course: An evaluation among Course Participants**
Dr. Liliany Virguez, University of Florida
Dr. Pamela L. Dickrell, University of Florida
Andrea Goncher, University of Florida

**Challenges in a Freshman General Education Class**
Dr. Michelle Maher, University of Missouri-Kansas City
Miss Kathleen O'Shea, University of Missouri-Kansas City
Dr. Jacob M. Marszalek, University of Missouri-Kansas City
Dr. Darran Cairns, University of Missouri-Kansas City

**The Power of ProTAsTM: Work in Progress Paper Assessing the Impact of Industry Professionals as Teaching Assistants and Mentors to Advance Engineering Design Education Innovations**
Dr. Lindy Hamilton Mayled, Arizona State University
Dr. Ryan J. Meuth, Arizona State University
Dr. Brent James Sebold, Arizona State University
Mr. Eric Prosser, Arizona State University

**A Survey about the Internet of Things (IoT): What does IoT Mean to Senior-level Industrial Design Students?**
Prof. Bekir Kelceoglu, Kean University

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**W313B - Design Teams 1**
**11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE**
**Sponsor: Design in Engineering Education Division**
**Moderator: Shanna Daly, University of Michigan**

**Understanding Students’ Experiences with Teamwork in the Australian Context**
Mr. Tahsin Mahmud Chowdhury, Virginia Tech
Dr. Homero Murzi, Virginia Tech
Sophia Vicente, Virginia Tech

**The Emergence of the Project Manager Role in Student Design Teams: A Mixed-Methods Exploratory Study**
Meagan Flus, University of Waterloo
Dr. Ada Hurst, University of Waterloo

**Automating Detection of Framing Agency in Design Team Talk**
Dr. Ardeshir Raihanian Mashhadi, University at Buffalo, SUNY
Dr. Vanessa Svihla, University of New Mexico

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**W313C - Empathy and Human-Centered Design 2**
**11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE**
**Sponsor: Design in Engineering Education Division**
**Moderator: Vanessa Svihla, University of New Mexico**

**Empathy in a Service-Learning Design Course**
Nusaybah Abu-Mulaweh, Purdue University at West Lafayette
Dr. William "Bill" C. Oakes, Purdue University at West Lafayette
Paul Leidig P.E., Purdue University

**The Wrong Theory Protocol: A Pre-Ideation Technique to Enhance Creativity and Empathy**
Dr. Vanessa Svihla, University of New Mexico
Luke Kachelmeier, University of New Mexico

**Can Empathy Be Taught? The Results of an Assignment Targeted at Improving Empathy in Engineering Design**
Devanshi Shah, University of Georgia
Miss Xiaou Yang, University of Georgia
Dr. Beshoy Morkos, University of Georgia

**Unconscious Bias in Peer Ratings of International Students’ Contributions to First-Year Design Projects**
Dr. Angela R. Bielefeldt, University of Colorado, Boulder
ASEE’S VIRTUAL CONFERENCE
WEDNESDAY, JUNE 24 SESSIONS
#ASEEVC

W313D - Design Teams 2
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Design in Engineering Education Division
Moderator: Robin Fowler, University of Michigan

Assessing the Culture of Engineering Student Project Teams
Dr. Laura J. Hirshfield, University of Michigan
Mr. James A. Coller, University of Michigan
Ms. Emily A. Madden, University of Michigan
Dr. Robin Fowler, University of Michigan

A Hybrid Approach to Team-forming for Capstone Design Projects
Dr. Peter Schuster, California Polytechnic State University, San Luis Obispo
Dr. Brian P. Self, California Polytechnic State University, San Luis Obispo
Mr. Eltahry Elghandour, California Polytechnic State University, San Luis Obispo
Dr. Lauren Anne Cooper, California Polytechnic State University, San Luis Obispo

Interdisciplinary Design Project Teams: Structuring an Impactful Experience
Prof. Jeanne M. Homer, Oklahoma State University
Mr. James Beckstrom, Oklahoma State University
Dr. Tom Elliott Spector, Oklahoma State University
Prof. John J. Phillips, Oklahoma State University
Prof. Khaled Mansy, Oklahoma State University
Mr. Jerry L. Stivers

Senior Capstone Team Formation Based on Project Interest: Team Selection by Students Compared with Team Selection by Instructors
Dr. Peter Schuster, California Polytechnic State University, San Luis Obispo
Dr. Lauren Anne Cooper, California Polytechnic State University, San Luis Obispo
Dr. Eltahry Elghandour, California Polytechnic State University, San Luis Obispo
Ms. Eileen W. Rossman P.E., California Polytechnic State University, San Luis Obispo
Sarah Harding, California Polytechnic State University, San Luis Obispo
Dr. Brian P. Self, California Polytechnic State University, San Luis Obispo

W314A - Experiences of Underrepresented Students in Engineering
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Educational Research and Methods Division
Moderators: Joana Marques Melo, Purdue University at West Lafayette; James Pembridge, Embry-Riddle Aeronautical University - Daytona Beach

Work in Progress: STEM Energy Education in California’s San Joaquin Valley
Prof. Abbas Ghassemi, University of California, Merced
Mr. Christopher A. Butler, University of California, Merced

Work in Progress: Identifying Structural and Cultural Characteristics of Hispanic-serving Institutions in Engineering Education – A Morphogenetic Approach
Indhira Maria Hasbún, Florida International University
Dr. Alexandra Coso Strong, Florida International University

Understanding the Demands and Resources for Academic Success of Second-career Undergraduate Engineering Students as Compared to Traditional Undergraduate and Graduate Engineering Students
Dr. Oleksandr Kravchenko, Old Dominion University
Dr. Konstantin Cigularov, Old Dominion University
Mr. Phillip Dillulio, Old Dominion University

Departures from the “Norm”: How Nontraditional Undergraduates Defined Their Success in an Alternative Engineering Transfer Program
Dr. Angela Minichiello P.E., Utah State University
Dr. Oenardi Lawanto, Utah State University
Dr. Sherry Marx, Utah State University

Combining Strategies for Leadership Development of Engineering Students
Dr. Nayda G. Santiago, University of Puerto Rico, Mayaguez Campus
Dr. Manuel A. Jimenez, University of Puerto Rico, Mayaguez Campus
Dr. Luisa Guillemard, University of Puerto Rico, Mayaguez Campus

Impacting Students from Economically Disadvantaged Groups in an Engineering Career Pathway
Dr. Manuel Jimenez, University of Puerto Rico, Mayaguez Campus
Dr. Luisa Guillemard, University of Puerto Rico, Mayaguez Campus
Dr. Sonia M. Bartolomei-Suarez, University of Puerto Rico, Mayaguez Campus
Prof. Oscar Marcelo Suarez, University of Puerto Rico,
ASEE’S VIRTUAL CONFERENCE
WEDNESDAY, JUNE 24 SESSIONS

W314B - Student Motivation, Identity, and Resilience
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Educational Research and Methods Division
Moderators: Courtney Faber, University of Tennessee at Knoxville; James Pembridge, Embry-Riddle Aeronautical University - Daytona Beach

Perceived Motivational Constructs and Engineering Students’ Academic Performance
Saira Anwar, Purdue University, West Lafayette
Dr. Muhsin Menekse, Purdue University, West Lafayette
Ahmed Ashraf Butt, Purdue University, West Lafayette

WIP: Motivation and Identity: The Impact of Identity on Recovering from Failure
Caroline Bolton, Bucknell University
Dr. Elif Miskioğlu, Bucknell University
Dr. Kaela M. Martin, Embry-Riddle Aeronautical University

WIP: Validating a Motivated Strategy for Learning Questionnaire (MSLQ) in an Active, Blended, and Collaborative (ABC) Dynamics Learning Environment
Ms. Wonki Lee, Purdue University, West Lafayette
Prof. Jeffrey F. Rhoads, Purdue University, West Lafayette
Dr. Edward J. Berger, Purdue University, West Lafayette
Prof. Jennifer DeBoer, Purdue University, West Lafayette

Motivation, Self-efficacy, and Student Engagement in Intermediate Mechanical Engineering Courses
Dr. Matthew J. Ford, Cornell University
Dr. Hadas Ritz, Cornell University
Prof. Elizabeth M. Fisher, Cornell University

Individual Resilience as a Competency for Aviation Professionals: A Review of the Literature
Timothy D. Ropp, Purdue University, West Lafayette
Stephen M. Belt, Saint Louis University

A Review of Agentic Frameworks in Engineering Education
Ms. Brianna Shani Benedict, Purdue University, West Lafayette
Mrs. Kayla R. Maxey, Purdue University, West Lafayette
Ms. Dina Verdin, Purdue University, West Lafayette
Dr. Allison Godwin, Purdue University, West Lafayette

W314C - Approaches to Assessment and Student Reflection
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Educational Research and Methods Division
Moderators: Michelle Soledad, Virginia Polytechnic Institute and State University; James Pembridge, Embry-Riddle Aeronautical University - Daytona Beach

Reconciling the Student’s Deliverables with the Instructor’s Expectations in Engineering Exams
Dr. Ephraim Zegeye, Liberty University
Dr. Tom Eldredge, Liberty University

The Conceptual Fluency Approach for Introductory Thermodynamics
Catherine Marie Hamel, University of Maryland
Prof. W. Ethan Eagle, University of Maryland

Measurement of the Effect of Interactive Questions in Lab Manuals on Student Learning
Sabrine Griffith, Harvey Mudd College
Spencer Rosen, Harvey Mudd College
Eleanor Byrnes, Harvey Mudd College
Dr. Laura Palucki Blake, Harvey Mudd College
Matthew Spencer, Harvey Mudd College

Four Complications in Designing a Validated Survey to Gather Information on Student Reactions to Reflection Activities
Kenya Mejia, University of Washington
Dr. Jennifer A. Turner, University of Washington
Wendy Roldan, University of Washington

The Napkin Sketch Pilot Study: A Minute-paper Reflection in Pictorial Form
Capt. Jes Barron, U.S. Military Academy
Lt. Col. Brad C. McCoy, U.S. Military Academy
Major John J. Case, U.S. Military Academy
Major John Andrew Kearby, U.S. Military Academy

Work in Progress: An Ecosystems Metaphor for Propagation
Dr. Susan Bobbitt Nolen, University of Washington
Dr. Milo Koretsky, Oregon State University

Schedule subject to change. Please go to www.asee20.pathable.co for up-to-date information
W314D - Understanding Student Behavior and Experiences
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Educational Research and Methods Division
Moderators: Patrick Cunningham, Rose-Hulman Institute of Technology; James Pembidge, Embry-Riddle Aeronautical University - Daytona Beach

Enhancing Peer Influence in STEM Learning and Engagement through Social Media Interactions Using Network Science Principles
Dr. Arif Mohaimin Sadri, Florida International University

Student Learning Strategies: Helping or Hindering Their Success?
Nancy Nelson, University of Calgary
Dr. Robert William Brennan, University of Calgary

Examining Relationships Between Student Interactions with Peers and Resources and Performance in a Large Engineering Course Using Social Network Analysis
Mr. Jack Elliott, Utah State University
Dr. Angela Minichiello P.E., Utah State University
Joel Ellsworth, Utah State University

Feedback-seeking Behaviors
Dr. Jeannine E. Turner, Florida State University
Min Tang
Mr. Shayne Kelly McConomy, Florida A&M University/Florida State University
Mostafa Papi
Dr. Jerris Hooker, Florida A&M University/Florida State University

An Analysis of Students' Brain Activity when Participating in Different Learning Activities
Miss Xinyue (Crystal) Liu, University of Toronto
Dr. Yasaman Delaviz, York University
Dr. Scott D. Ramsay, University of Toronto

W316 - ECCD Technical Session 5: Energy and Wind and Design
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Energy Conversion and Conservation Division
Moderators: Sandip Das, Kennesaw State University; Ted Song, John Brown University

Papers presented in this session are related to energy, wind, and design, and their educational aspects.

Power Generation Through Small-scale Wind Turbine
Prof. Bala Maheswaran, Northeastern University
Ms. Alya Abd Aziz, Northeastern University
Mr. Evan Alexander,
Ms. Laura Brigandi, Northeastern University
Cole Branagan, Northeastern University

Air-conditioning Unit Performance Analysis Equipped with a Shaded Condenser
Dr. Maher Shehadi, Purdue Polytechnic Institute

Mobile Renewable Response Trailer (MRRT) for Disaster Relief Efforts
Dr. Reg Pecen, Sam Houston State University
Dr. Keith L. Coogler, Sam Houston State University
Dr. Faruk Yildiz, Sam Houston State University
Dr. Ulan Dakeev, Sam Houston State University

Hybrid Green Vessel Design
Joseph C. Rodriguez, United States Coast Guard Academy
Scott C. Pierce, United States Coast Guard Academy
Brennen McCulloch
Mr. George McBurney, United States Coast Guard Academy
ASEE’S VIRTUAL CONFERENCE
WEDNESDAY, JUNE 24 SESSIONS

W318 - Engineering Design Graphics Division Technical Session 2
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Design Graphics Division
Moderator: Ranjeet Agarwala, East Carolina University

Focuses on visualization and the technological needs of engineering faculty and other engineering educators.

Cloud-based Computer-aided Engineering Education: Finding the Silver Lining
Dr. Derek M. Yip-Hoi, Western Washington University

Contextualized Design Projects in Graphics and Visualization Course: Student Perceptions and Sustainability Systems-thinking Knowledge
Dr. Raghu Pucha, Georgia Institute of Technology
Dr. Sunni Haag Newton, Georgia Institute of Technology
Dr. Meltem Alemdar, Georgia Institute of Technology
Dr. Rebecca Watts Hull, Georgia Institute of Technology
Adhiraj Bhagat, Georgia Institute of Technology

Evaluation of a Puzzle-based Virtual Platform for Improving Spatial Visualization Skills in Engineering Freshmen
Dr. Vimal Kumar Viswanathan, San Jose State University
Sadaqatali Hussainali Mirza, San Jose State University
Dr. Chitra R. Nayak, Tuskegee University
Dr. Maria Calhoun, Tuskegee University

W320A - Innovating Ethics Curriculum and Instruction
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Ethics Division
Moderators: Alison Kerr, The University of Tulsa; Joel Schneider, Stanford University

Ethical Development through the Use of Fiction in a Project-based Engineering Program
Dr. Rob Sleezer, Minnesota State University, Mankato
Dr. Rebecca A. Bates, Minnesota State University, Mankato

Work in Progress: A One-page Ethical Checklist for Engineers
Dr. Elizabeth A. DeBartolo, Rochester Institute of Technology
Prof. Wade L. Robison, Rochester Institute of Technology
Sarah Aileen Brownell, Rochester Institute of Technology

Equity, Inclusion, and Ethics: Adapting a Mentoring Curriculum to Develop an Ethics Workshop for Engineering Students
Dr. Katy Luchini-Colbry, Michigan State University
Dr. Melissa McDaniels, Michigan State University

An Investigation of When and Where Ethics Appears in Undergraduate Engineering Curricula
Dr. Andrew Katz, Virginia Tech
Mr. Umair Shakir, Virginia Tech

W320B - Ethical Design
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Ethics Division
Moderators: Jonathan Aurand, Dunwoody Institute; Basel Alsayyed Ahmad, University of Alberta

Integrating Ethics into the Curriculum Through Design Courses
Prof. Scott A. Civjan, University of Massachusetts, Amherst
Prof. Nicholas Tooker, University of Massachusetts, Amherst

Building Better Worlds: An Interdisciplinary Approach to Engineering Ethics Pedagogy
Dr. Amy Schroeder, University of Southern California

Developing and Applying Knowledge and Skills in Ethics and Professional Morality: An Evidence-based Practice Paper
Dr. Donald Winiecki, Boise State University
Mr. Lynn Catlin P.E., Boise State University
Dr. Harold Ackler, Boise State University

W321 - Assessing, Expanding, and Innovating Information Literacy
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Libraries Division
Moderators: Angela Henshilwood, University of Toronto; Lisa Ngo, University of California, Berkeley

Extending the Role of the Library and Librarian: Integrating Alternative Information Literacy into the Engineering Curriculum
Ms. Erin Rowley, University at Buffalo
Dr. Lauren Kuryloski, University at Buffalo
Dr. Kristen Moore, University at Buffalo

Schedule subject to change. Please go to www.asee20.pathable.co for up-to-date information
Using a Faceted Taxonomy to Investigate Student Selection of Information Sources in an Engineering Lab Course

Ms. Amber Janssen, California State University Maritime Academy
Dr. William W. Tsai, California State University Maritime Academy

Assessment of Consultations for an Industrial Distribution Writing-Intensive Course

Prof. Pauline Melgoza, Texas A&M University
Ashlynn Kogut, Texas A&M University
Mr. Michael Ryan Golla, Texas A&M University

Lifelong Learning in an Engineering Communication Course

Prof. S. Norma Godavari, University of Manitoba
Dr. Anne E. Parker, University of Manitoba

Credited Information Literacy Training Sessions for Graduate Students - Still Relevant after 18 years: A Case Study

Elise Anne Basque, Ecole Polytechnique de Montreal
Christine Brodeur, Ecole Polytechnique de Montréal
Manon Du Ruisseau, Ecole Polytechnique de Montreal
Mr. Jimmy Roberge, Ecole Polytechnique de Montreal
Mrs. Arina Soare, Ecole Polytechnique de Montreal
Mrs. Marie Tremblay, Ecole Polytechnique de Montreal

W322 - EMD 2: Issues in Engineering Management Education

11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Management Division
Moderator: John Richards, United States Military Academy

Papers related to retention/completion, education improvements, and mentoring.

Interleaving Lenses to Scale Our Units of Analysis for Engineering Education Improvement

Mr. Nicholas Jon Monacelli
Dr. Jennifer Karlin, Minnesota State University, Mankato

Piloting an Undergraduate Engineering Mentoring Program to Enhance Gender Diversity

Ms. Elizabeth Hart, University of Dayton
Miss Andrea Mott, University of Dayton
Dr. Sandra L. Furterer, University of Dayton

Predicting Student Degree Completion Using Random Forest

Tatiana A. Cardona, Missouri University of Science and Technology
Dr. Elizabeth A. Cudney, Missouri University of Science and Technology

Dr. Jennifer Snyder, Valencia College
Dr. Roger Wesley Hoerl, Union College

W323 - STEM Issues in ET
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Technology Division
Moderator: Kathryn Kelley, The Ohio State University

Development of an Interdisciplinary, Project-based Scientific Research Course for STEM Departments

Dr. Faruk Yildiz, Sam Houston State University
David E. Thompson, Sam Houston State University

Enhancing STEM Retention and Graduation Rate by Incorporating Innovative Teaching Strategies in Selected STEM Introductory Courses

Dr. Nikunja Swain P.E., South Carolina State University
Prof. Cynthia T. Davis, South Carolina State University
Dr. Biswajit Biswal, South Carolina State University
Dr. Eugene Kennedy, Louisiana State University

Evaluating Student Conceptions of Technology Majors: Development of Assessment Keyword Tables

Dr. Matthew Turner, Purdue University, New Albany
Dr. Rustin Webster, Purdue University, New Albany

Impact of Mentor-Mentee Fit in Preparing Undergraduate STEM Students to Teach Engineering Technology for Elementary Students

Dr. Lei Xie, Texas State University
Dr. Malini Natarajarathinam, Texas A&M University
Dr. Bugrahan Yalvac, Texas A&M University

W324 - ENT Division Technical Session: Entrepreneurship and IP
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Entrepreneurship & Engineering Innovation Division
Moderators: Prateek Shekhar, New Jersey Institute of Technology; Jason Forsyth, James Madison University

A Systematic Review of Student Entrepreneurial Failure in Engineering Education

Dr. Thomas M. Katona, California Polytechnic State University, San Luis Obispo
Dr. Sarah E. Zappe, Pennsylvania State University, University Park
Dr. Joe Tranquillo, Bucknell University

An Online Course on Intellectual Property for Undergraduate and Graduate Engineers and Scientists

Prof. Howard B. Rockman, University of Illinois at Chicago
Exposure of Undergraduate Research Students to Entrepreneurial Activities to Motivate Future Research Careers
Prof. Ranji K. Vaidyanathan, Oklahoma State University
Dr. Mwarumba Mwavita, Oklahoma State University
Kathryn Ann Bartosik, Clarkson University
Pankaj Sarin, Oklahoma State University

Faculty Views of Undergraduate Intellectual Property Policies and Practices
Dr. Soohyun Yi, Texas Tech University
Dr. Nathalie Duval-Couetil, Purdue University, West Lafayette

Fostering Entrepreneurship in Project-based Software Engineering Courses
Dr. Kevin Buffardi, California State University, Chico
David Rahn, California State University, Chico

W326 - Experimentation and Laboratory-oriented Studies Division Technical Session 4
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Experimentation and Laboratory-Oriented Studies Division
Moderator: Hitesh Vora, Oklahoma State University

“Just in Time” Mechatronics in Senior Design Capstones
Dr. Robert J. Rabb P.E., The Citadel
Dr. James Righter, The Citadel

Scaffolded Laboratory Sequence: Mechanics Lab
Dr. Natasha Smith P.E., University of Virginia

Composite Materials Courses in Colombia
Ing. Esteban Maya Muñoz, Universidad del Valle
Prof. Ronald Sterkenburg, Purdue University, West Lafayette
Dr. Jairo Antonio Valdes Ortiz, Universidad del Valle
Prof. Guillermo Andrés Jaramillo Pizarro P.E., Universidad del Valle

Pilot Study Results from Using TrussVR® to Learn About Basic Trusses
Dr. Sean Maw P.Eng., University of Saskatchewan
Ryan Banow, University of Saskatchewan

W327 - First-year Programs: Professional Development and Skills
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: First-year Programs Division

How are we preparing our students for the workforce and giving them professional skills in their first year?

A First-year Career Development Course: Securing and Succeeding in an Engineering Job
Dr. Jennifer Sinclair Curtis, University of California, Davis

Work in Progress: Student Perceptions of Professional Integrity Modules Incorporated in a First-year Engineering Program
Dr. Irene B. Mena, University of Pittsburgh

Work in Progress: Integrating Information Literacy into a Multidisciplinary First-year Engineering Program
Mr. Alexander James Carroll, Vanderbilt University
Dr. Joshua Daniel Borycz, Vanderbilt University
Dr. Julianne Vernon, Vanderbilt University

Work in Progress: Professional Development Module in First-year Engineering Courses
Dr. Olukemi Akintewe, University of South Florida
Dr. Jonathan Elliot Gaines, University of South Florida
Anna Maria Bateman, University of South Florida
Ms. Lynn Chisholm, University of South Florida

Asking Questions About Data: First-year Engineering Students’ Introduction to Data Analytics
Mr. Ruben D. Lopez-Parra P.E., Purdue University, West Lafayette
Mr. Aristides Carrillo Fernández, Purdue University, West Lafayette
Amanda Johnston, Purdue University, West Lafayette
Prof. Tamara J. Moore, Purdue University, West Lafayette
Dr. Sean P. Brophy, Purdue University, West Lafayette

W328 - Professional Development for Graduate Students
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Graduate Studies Division

Technical Leadership Skills Development Through Interactive Workshops
Mr. Eric Holloway, Purdue University at West Lafayette; Jeffrey Fergus, Auburn University
W330 - Computing and Information Technology Division Technical Session 4

11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Computing and Information Technology Division

Moderators: Mia Minnes, University of California, San Diego; Yosi Shibberu, Rose-Hulman Institute of Technology

This session presents papers on a variety of topics pertaining to computing and information technology.

Writing Effective Autograded Exercises Using Bloom’s Taxonomy
- Dr. Lina Battestilli, North Carolina State University
- Ms. Sarah Korkes, North Carolina State University

Predicting Retention Rates from Students’ Behavior
- Dr. Awatif Amin, Johnson C. Smith University

Work in Progress: Student-generated Material for Artificial Intelligence Course
- Dr. Stephany Coffman-Wolph, Ohio Northern University
- Dr. Kimberlyn Gray, West Virginia University Institute of Technology

Autonomous Vehicles in Computer Engineering Program
- Dr. Afsaneh Minaie, Utah Valley University
- Dr. Reza Sanati-Mehrizy, Utah Valley University
- Benjamin Chambers

W332 - Cultural Issues in Engineering: International Division Technical Session 2

11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: International Division

Moderators: Sigrid Berka, The University of Rhode Island; Joseph Menicucci, Montana State University - Bozeman; Phillip Sanger, Purdue University at West Lafayette

This session covers issues encountered in cross-cultural diversity and competencies.

Cross-cultural Engineering Skill Development at an International Engineering Summer Boot Camp
- Dr. Nicholas Andres Brake, Lamar University
- Dr. Oleksandra Sehin, Texas State University
- Mr. John Wade Partain, Universidad Politecnica de Guanajuato
- Dr. Damian Valles, Texas State University
- Dr. Alberto Marquez P.E., Lamar University
- Dr. Jesus Alejandro Jimenez, Texas State University
- Dr. George Saltsman, Lamar University
- Ms. Rosario Davis, Texas State University

Cultural Relativism and Technology Transfer in Engineering Education
- Dr. Jayanta K. Banerjee, University of Puerto Rico, Mayaguez Campus

Work in Progress: Global Engineering Perspectives Scholars Program
- Prof. Donna M. Ebenstein, Bucknell University
- Prof. L. Felipe Perrone, Bucknell University
- Dr. Margot A. Vigeant, Bucknell University
- Dr. Deborah L. Sills, Bucknell University
- Dr. Craig Beal, Bucknell University
- Dr. Amal Kabalan, Bucknell University
- Dr. Susan R. Baish, Bucknell University
- Dr. Arshia Khan, University of Minnesota, Duluth
- Dr. Rania Al-Hammoud P.Eng., University of Waterloo
- Dr. Ona Egbue, University of South Carolina, Upstate

Understanding Students’ Perceptions of Dimensions of Engineering Culture in Ecuador
- Dr. Miguel Andres Guerra, Universidad San Francisco de Quito
- Dr. Homero Murzi, Virginia Tech
- Mr. Johnny Crayd Woods Jr., Virginia Tech
- Mr. Abram Diaz-Strandberg, Virginia Tech
W333A - Pre-college Engineering Education Division Technical Session 5
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Pre-College Engineering Education Division
Moderator: AnnMarie Thomas, University of St. Thomas

Advancing High School STEM Education: Implications for Engineering Technology
Dr. Anne M. Lucietto, Purdue University, West Lafayette
Dr. Mesut Akdere, Purdue University, West Lafayette
Dr. Scott R. Bartholomew, Purdue University, West Lafayette
Dr. Greg J. Strimel, Purdue University, West Lafayette

Developing Transmedia Engineering Curricula Using Cognitive Tools to Impact Learning and the Development of STEM Identity
Dr. Glenn W. Ellis, Smith College
Dr. Jeremiah Pina, Smith College
Dr. Rebecca Mazur,
Mr. Al Rudnitsky, Smith College
Prof. Beth McGinnis-Cavanaugh, Springfield Technical Community College
Isabel Huff, Springfield Technical Community College
Sonia Ellis, Smith College, Springfield Technical Community College
Crystal M. Ford, Smith College
Kate Lytton, Collaborative for Educational Services
Ms. Kaia Claire Cormier, Smith College

W333B - Pre-college Engineering Education Division Technical Session 6
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Pre-College Engineering Education Division
Moderator: Sarah Lilly, University of Virginia

WIP: An Effective Model for Leveraging Field Trips to Broaden Participation in STEM
Mrs. Claire Duggan, Northeastern University
Dr. Ibrahim F. Zeid, Northeastern University
Mrs. Jennifer Ocif Love, Northeastern University
Mr. Nicolas Leo Fuchs, Northeastern University
Ms. Emily Chemich
Ms. Brittany Fung, Northeastern University

WIP: Effective Identity-Safety Cues for Assuaging Social Identity Threat of Young Black Girls in STEM
Dr. Janille A. Smith-Colin, Southern Methodist University
Dr. Jeanna Wieselmann, Southern Methodist University

WIP: Pilot Evaluation of a Summer Camp to Attract Middle School Students to STEM
Murad Musa Mahmoud, Wartburg College
Ms. Trinity Borland, Wartburg College
Mr. Ripken Gehrig Holst, Wartburg College
Prof. Kurt Henry Becker, Utah State University

WIP: Building Capacity to Promote STEAM in Communities - The Impact of Professional Development for Teachers, Instructors, and Staff Members
Mr. Marcelo Caplan, Columbia College

WIP: Engaging Pre-college Students in Hypothesis Generation Using a Citizen Scientist Network of Air Quality Sensors
James A. Moore
Matthew Dailey
Mr. Zachary Wilhelm, University of Utah
Dr. Kerry Kelly, University of Utah
Pascal Goffin, University of Utah
Prof. Anthony Butterfield, University of Utah
Prof. Jason Wiese
Dr. Wei Xing, University of Utah
Katrina Myquyen Le, University of Utah
Mr. Thomas Becnel, University of Utah
Prof. Pierre-Emmanuel Gaillardon
W334 - Relationships Between Skills and Knowledge Domains
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Liberal Education/Engineering & Society Division
Moderator: Sean Ferguson, University of Virginia

A Teacher’s Journey Through Engineering and Liberal Arts
Prof. Keith E. Hedges, Drury University

Correlating the Student Engineer’s Design Process with Emotional Intelligence
Dr. Ryan H. Koontz, South Dakota School of Mines and Technology
Dr. Daniel F. Dolan, South Dakota School of Mines and Technology
Kimberly Karen Osberg, South Dakota School of Mines and Technology

Does Playing the Violin Help Science Students Become Better Scientists?
Prof. Wei Yao, Zhejiang University
Mr. Bifeng Zhang, Zhejiang University
Dr. Hu Shunshun, Zhejiang University

Investigating the Relationship Between Self-efficacy and Perceived Importance of Communication Skills Among Engineering Students
Mr. Zhen Zhao, Arizona State University
Dr. Samantha Ruth Brunhaver, Arizona State University

W335 - Student Learning Assessment Methods
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Manufacturing Division
Moderator: Ismail Fidan, Tennessee Tech University

Assessment of Metacognitive Skills in Design and Manufacturing
Dr. Lisa Jo Elliott, Pennsylvania State University, Erie
Dr. Faisal Aqlan, Pennsylvania State University, Erie
Dr. Richard Zhao, Pennsylvania State University, Erie
Morgan Scott Janney, Pennsylvania State University, Erie

Text Mining-based Qualitative Student Assessment of Interactive Simulation Learning Using SIMIO Tool – A Work in Progress
Dr. Aditya Akundi, University of Texas Rio Grande Valley
Dr. Immanuel Edinbarough P.E., University of Texas Rio Grande Valley

Integrating Manufacturing-related Materials and Quality Control Standards into Master-level Engineering Education
Dr. Hua Li, Texas A&M University, Kingsville
W338A - Mechanical Engineering Technical Session: Pedagogy I - Best Teaching Practices
10:40 AM - 11:00 AM, ONLINE, A VIRTUAL CONFERENCE
Sponsor: Mechanical Engineering Division
Moderator: Anna Howard, North Carolina State University at Raleigh

This session contains papers on best teaching practices within Mechanical Engineering. Papers on effective learning strategies, the application of automatic problem generators, self-evaluation and revision method and cumulative/practice tests will be presented.

Assessing the Effectiveness of an Automated Problem Generator to Develop Course Content Rapidly and Minimize Student Cheating
Dr. Philip Jackson, University of Florida
Ricker Lamphier, University of Florida

Does the Use of Cumulative and Practice Tests Further Improve a Blended STEM Classroom?
Prof. Autar Kaw, University of South Florida
Dr. Renee M. Clark, University of Pittsburgh

Effective Learning Strategies: Grading Rubric to Enhance Student Learning
Dr. Muzammil Arshad, Texas A&M University
Dr. R. R. Romatoski, Saint Ambrose University

The Self-evaluation and Revision Method for Homework: A Homework Method for Metacognition Improves Post-secondary Engineering Students’ Attitudes Toward Homework
Major Patrick Alan Linford, U.S. Military Academy
Lt. Col. James E. Bluman, U.S. Military Academy
Dr. Gregory Martin Freisinger, U.S. Military Academy
Prof. John R. Rogers, U.S. Military Academy
Lt. Col. Brian J. Novoselich, U.S. Military Academy

W338B - Mechanical Engineering Technical Session: Dynamics II - Feel the Vibe
10:40 AM - 11:00 AM, ONLINE, A VIRTUAL CONFERENCE
Sponsor: Mechanical Engineering Division
Moderator: Ronald Adrezin, United States Coast Guard Academy

This technical session will contain papers focused on pedagogy and assessment using vibrations projects and case studies as a backdrop.

Design of Instructional Tools to Facilitate Understanding of Fluid Viscous Dampers in A Vibration and Controls Class and Course Assessment
Dr. Yucheng Liu P.E., Mississippi State University

Visualizing the Inherent Properties and Animated Responses of Vibrating Systems Based on Finite Element Modelling
Prof. Shengyong Zhang, Purdue University Northwest

A Mastery-based Learning Model for an Upper-level Vibration Analysis Course
Dr. Kurt M. DeGoede, Elizabethtown College

W338C - Mechanical Engineering Technical Session: Capstone and Design
11:20 AM - 11:40 AM, ONLINE, A VIRTUAL CONFERENCE
Sponsor: Mechanical Engineering Division
Moderator: Brian Novoselich, United States Military Academy

This session will focus on all things relating to capstone design and mechanical engineering projects. Sample courses and projects will be presented, as well as understanding the role of the team in engineering projects.

Design Course in a Mechanical Engineering Curriculum
Dr. Jamie Szwalek, University of Illinois at Chicago
Dr. Yeow Siow, University of Illinois at Chicago
Miss Jaqueline Oxmara Rojas Robles, University of Illinois at Chicago

Engineering Capstone Design of a Radio Telescope
Dr. Stephen Andrew Wilkerson P.E., York College of Pennsylvania
Dr. Stephen Andrew Gadsden, University of Guelph
Dr. Kala Meah, York College of Pennsylvania
Prof. Donald Jerome Hake II, York College of Pennsylvania

Performance Balanced Team Formation for Group Study and Design Projects
Dr. Amir Karimi P.E., University of Texas at San Antonio
Dr. Randall D. Manteufel, University of Texas at San Antonio

Educational Opportunities of a Designed-based Project that Challenges Freshman Students to Build a Miniature Racing Car
Prof. Farid Breidi
Mr. Jotam E. Chen, University of Southern Indiana
Ms. Madelyn D. Sturgeon
Mr. Justin Michael Amos, University of Southern Indiana
W339A - Alternative Methods of Teaching and Learning Mechanics
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Mechanics Division
Moderators: Ron Averill, Michigan State University; Carisa Ramming, Oklahoma State University

The Mechanics Project: A Pedagogy of Engagement for Undergraduate Mechanics Courses
Prof. Keith D. Hjelmstad, Arizona State University
Amie Baisley, University of Florida

Structuring Student Success: Incorporating a Genre-based Pedagogical Method to Improve a Strength of Materials Laboratory Manual
Dr. Eleazar Marquez, Rice University
Dr. Samuel Garcia Jr., Texas State University

Implementation and Evaluation of Active-learning Techniques: Adaptable Activities for a Variety of Engineering Courses
Dr. Jillian Schmidt, Missouri University of Science and Technology
Dr. Nicolas Ali Libre, Missouri University of Science and Technology

The ‘Typical Particle’ Approach to Learning Rigid Body Dynamics
Prof. Keith D. Hjelmstad, Arizona State University
Amie Baisley, University of Florida

W339B - Hybrid and Online Teaching of Mechanics
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Mechanics Division
Moderators: Nicolas Libre, Missouri University of Science and Technology; Sarah Wodin-Schwartz, Worcester Polytechnic Institute

Dynamics Online Course: A Challenge Content Delivered with Best Teaching Practices Keeps Students Engaged
Dr. Carmen M. Muller-Karger, Florida International University
Dr. Lili Steiner, Florida International University

Blended Statics: Finding an Effective Mix of Traditional and Flipped Classrooms in an Engineering Mechanics Course
Mr. Serge Raymond Maalouf, University of Maine
Dr. Olivier Putzeys P.E., University of Maine

WIP: Study to Lower DFQ Rates in Statics and Dynamics for Multiple Engineering Majors
Dr. Carlos R. Corleto, Texas A&M University
Dr. Matilda (Tillie) Wilson McVay, Texas A&M University

W340 - Minorities in Engineering Division Technical Session 3
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Minorities in Engineering Division
Moderator: Peter Golding, University of Texas at El Paso

A Decade-long Programmatic Study of SHPE’s Chapter Reporting Program: Best Practices, Lessons Learned, and Outcomes for National Engineering Diversity Chapter-based Organizations (Experience)
Dr. Mauro Rodriguez Jr, California Institute of Technology
Ms. Karen Mariela Siles, IBM Corporation
Dr. Dora Louise Renaud, Society of Hispanic Professional Engineers

Broadening the Participation of Latinx in Engineering: Highlights from a National, Longitudinal Study
Dr. Lisa Y. Flores, University of Missouri
Dr. Rachel L. Navarro, University of North Dakota
Dr. Heather Hunt, University of Missouri
Dr. Hang-Shim Lee, Konkuk University
Dr. Patton O. Garriott, University of Denver

¿Por qué no los dos? The Importance of Translanguaging in Bridging Language, Literacy, and Engineering
Dr. Joel Alejandro Mejia, University of San Diego
Melissa M. Arana
Mireya Becker Roberto, University of San Diego
Miss Nicole G. Reyes
W341 - Multidisciplinary Engineering Experiences
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Multidisciplinary Engineering Division
Moderators: Homero Murzi, Virginia Polytechnic Institute and State University; Simin Hall, Virginia Polytechnic Institute and State University

Enabling Transdisciplinary Education for Energy Systems Transitions
Mr. Miles Skinner
Dr. Sven Anders, University of Alberta
Dr. Pierre Mertiny, University of Alberta

Implementing Interactive 3-D Models in an Entry-level Engineering Course to Enhance Students’ Visualization
Dr. Alexandra Hain, University of Connecticut
Dr. Sarira Motaref P.E., University of Connecticut

STEM-Oriented Alliance for Research (SOAR): An Educational Model for Interdisciplinary Project-based Learning
Dr. Jacob Murray, Washington State University, Everett
Prof. Lucrezia Cuen Paxson, Washington State University, Everett
Dr. Soobin Seo, Washington State University, Everett
Dr. Mark Beattie, Washington State University, Everett

What is Energy? Examining Engineering Students’ Conceptions of Energy
Madeline Nelson, University of San Diego
Prof. Gordon D. Hoople, University of San Diego
Dr. Joel Alejandro Mejia, University of San Diego
Dr. Diana Chen, University of San Diego
Dr. Susan M. Lord, University of San Diego

A Multidisciplinary Project: Deploying Edge Computing to Augment Endpoint Functionality
Dr. Ciprian Popoviciu, East Carolina University
Dr. Philip J. Lunsford II, East Carolina University
Dr. John Pickard, East Carolina University
Mr. Colby Lee Sawyer, East Carolina University
Mr. Dale Drummond, East Carolina University
Mr. Zachary Ryan Zynda, East Carolina University
Mr. Spencer Lee
Mr. Sean Wear

W342 - New Engineering Educators 1: Learning Aids
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: New Engineering Educators Division
Moderators: Ashish Borgaonkar, New Jersey Institute of Technology; Kerry Widder, Milwaukee School of Engineering

A Case Study of Early Performance Prediction and Intervention in a Computer Science Course
Prof. Mariana Silva, University of Illinois at Urbana-Champaign
Eric G. Shaffer, University of Illinois at Urbana-Champaign
Nicolas Nytko, University of Illinois at Urbana-Champaign
Dr. Jennifer R. Amos, University of Illinois at Urbana-Champaign

Making Large Classes Work for You and Your Students
Dr. Edward F. Gehringer, North Carolina State University

Improving Student Accessibility, Equity, Course Performance, and Lab Skills: How Introduction of ClassTranscribe is Changing Engineering Education at the University of Illinois
Prof. Lawrence Angrave, University of Illinois at Urbana-Champaign
Prof. Karin Jensen, University of Illinois at Urbana-Champaign
Mr. Zhilin Zhang, University of Illinois at Urbana-Champaign
Mr. Chirantan Mahipal, University of Illinois at Urbana-Champaign
David Mussulman, University of Illinois at Urbana-Champaign
Prof. Christopher D. Schmitz, University of Illinois at Urbana-Champaign
Dr. Robert Thomas Baird, University of Illinois Center for Innovation in Teaching and Learning
Prof. Hongye Liu, University of Illinois at Urbana-Champaign
Mr. Ruihua Sui, University of Illinois at Urbana-Champaign
Dr. Maryalice S. Wu
Mr. Rob Kooper, NCSA / University of Illinois at Urbana-Champaign

Visual Note-taking: Opportunities to Support Student Agency in Active Learning
Wendy Roldan, University of Washington
Mr. Schwannery Lin
Ms. Yuxin Xu, University of Washington
Andrea Jacqueline Sequeira
Dr. Jennifer A. Turns, University of Washington
W345 - Engineering Physics and Physics Division Technical Session 4
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Physics and Physics Division
Moderators: Yumin Zhang, Southeast Missouri State University; Robert Ross, University of Detroit Mercy
Navigating and Energy-Generating Insole: Vibrating Walking Directions
  Prof. Bala Maheswaran, Northeastern University
  Liza Brooke Russell, Northeastern University
  Cailey Moy Denoncourt, Northeastern University
Introductory Physics: Introducing Ethics
  Dr. Jessica Patricia Conry, Arkansas Tech University
  Dr. Amber Harrington, Arkansas Tech University
The D and F Ionosphere Layers: Why are AM Broadcast Signals Mostly Local?
  Dr. Paul Benjamin Crilly, U.S. Coast Guard Academy

W349 - Curriculum Development in Technological Literacy
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Technological and Engineering Literacy/Philosophy of Engineering Division
Moderator: Soheil Fatehiboroujeni, Purdue University at West Lafayette
This session contains a variety of papers that explore curriculum development issues with respect to technological and engineering literacy.
Complexity, Right Action, and the Engineering Curriculum
  Dr. R. Alan Cheville, Bucknell University
  Prof. John Heywood, Trinity College Dublin
Small Teaching via Bloom’s
  Dr. Marjan Eggermont, University of Calgary
The transition from STEM to STEAM
  Dr. Jayanta K. Banerjee, University of Puerto Rico, Mayaguez Campus
Assessment of Gregorc Style Delineators
  Dr. Mysore Narayanan, Miami University

W350A - Two-year College Division: Transferring and Smoothing Transitions
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Two-year College Division
Moderators: Djedjiga Belfadel, Fairfield University; Dominic Dal Bello, Allan Hancock College
Papers related (but not limited) to transfer issues for students and institutions.
Curricular Complexity as a Metric to Forecast Issues with Transferring into a Redesigned Engineering Curriculum
  Dr. David Reeping, Virginia Tech
  Dustin Grote
  Dr. Lisa D. McNair, Virginia Tech
  Prof. Thomas Martin, Virginia Polytechnic Institute and State University
Phase One Research Results from a Project on Vertical Transfer Students in Engineering and Engineering Technology
  Dr. Surendra "Vinnie" K. Gupta, Rochester Institute of Technology (COE)
  Dr. James E. Moon, Rochester Institute of Technology (COE)
  Prof. Thomas Martin, Virginia Polytechnic Institute and State University
  Dr. David Reeping, Virginia Tech
  Dustin Grote
  Dr. Lisa D. McNair, Virginia Tech
  Prof. Thomas Martin, Virginia Polytechnic Institute and State University
Achieving Broader Impacts in STEM at Two-year Hispanic Serving Institutions
  Cynthia Kay Pickering, Science Foundation Arizona
  Caroline VanIngen-Dunn, SFAz Center for STEM, Arizona State University
  Ms. Anita Grierson, SFAz Center for STEM at Arizona State University
  Anna Tanguma-Gallegos
The Missing Third: The Vital Role of Two-year Colleges in Shrinking Engineering Education Deserts
  Dr. Jennifer Karlin, Minnesota State University, Mankato
  Dr. L. Eric James, Iron Range Engineering
  Prof. Rebecca A Bates, Minnesota State University, Mankato

Schedule subject to change. Please go to www.asee20.pathable.co for up-to-date information
ASEE'S VIRTUAL CONFERENCE
WEDNESDAY, JUNE 24 SESSIONS

W350B - Two-year College Division: Workforce Pathways and ATE
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Two-year College Division
Moderators: Philip Regalbuto, Trident Technical College; Dominic Dal Bello, Allan Hancock College

Papers related (but not limited) to workforce pathways and advanced technological education.

Impacts of the National Science Foundation-funded Mentor-Connect Project on Two-year Colleges
Ms. Elaine L. Craft, Florence-Darlington Technical College
Mr. David M. Hata, Portland Community College
Emery DeWitt, Mentor-Connect/FDTC
Dr. Liesel Ritchie, Oklahoma State University
Dr. Nenelia Campbell, Collaborative for the Social Dimensions of Disasters
Dr. Jamie Vickery, Center for the Study of Disasters and Extreme Events, Oklahoma State University

Comparing Florida’s Advanced Manufacturing Curriculum Framework to the Department of Labor Competency Model
Pallavi Ramakanth Kowligi, Florida State University
Ms. Priyanka Prajapati, Florida State University
Dr. Faye R. Jones, Florida State University
Dr. Marcia A. Mardis, Florida A&M University/Florida State University

Filling the Technical Gap: The Integration of Technical Modules in a REU Program for 2+2 Engineering Students
Mrs. Megan Morin, University of North Carolina - Chapel Hill
Alireza Dayerizadeh, North Carolina State University

Emerging Role of Two-year Hispanic-serving Institutions (HSIs) in Advanced Technological Education (ATE): Challenges, Opportunities, and Impacts for Growing the United States Technical Workforce
Cynthia Kay Pickering, Science Foundation Arizona Center for STEM at Arizona State University
Ms. Elaine L. Craft, Florence-Darlington Technical College
Caroline VanIngen-Dunn, Arizona State University

Building a Comprehensive Collaborative Infrastructure to Create Instrumentation Workforce Pathways
Ms. Alicia Boudreaux Kiremire PE, PMP, FlowStream Management LLC
Dr. Michael K. Swanbom PE, Louisiana Tech University
Mr. Gerry Caskey, Louisiana Delta Community College
Barton Crum, Applied Research for Organizational Solutions (AROS)
Miss Juliette Pate, Louisiana Delta Community College

W351A - Women in Engineering Division Technical Session 2
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Women in Engineering Division
Moderators: Anne Lucietto, Purdue Polytechnic Institute; Yuting Chen, University of Illinois at Urbana - Champaign

Gender Stereotypes: Historical Comparison of Female Students’ Beliefs on Career, Marriage, and Children (1935 versus 2019 Populations)
Dr. Suzanne Zurn-Birkhimer, Purdue University-Main Campus, West Lafayette (College of Engineering)
Ing. Mayari Illarij Serrano Anazco, Purdue Polytechnic Institute

Professional Women Identify Their Professional and Personal Needs
Dr. Anne M. Lucietto, Purdue Polytechnic Institute
Dr. Diane L. Peters P.E., Kettering University
Liza Ann Russell, Purdue University
Miss Meher Rusi Taleyarkhan, Purdue University
Ms. Shelly Tan

Our Guiding Star: Engineering Design. But Where Is It Guiding Us?
Robyn Paul, University of Calgary
Prof. Laleh Behjat P.Eng., University of Calgary
Dr. Bob Brennan P.Eng., University of Calgary

Women’s Unique Challenges in the Transitions to Engineering Work
Chris Gewirtz, Virginia Tech
Francesca Giardine, Smith College
Prof. Robin Ott, Virginia Polytechnic Institute and State University
Anne Kary

Schedule subject to change. Please go to www.asee20.pathable.co for up-to-date information
**W351B - Women in Engineering Division Technical Session 3**

11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE

**Sponsor: Women in Engineering Division**

**Moderators: Linda Ott, Michigan Technological University; Bethany Brinkman, Sweet Briar College**

**Addressing Gender Disparities in Computing Majors and Careers: Development and Effects of a Community Support Structure**

- Prof. Shaundra Bryant Daily, Duke University
- Dr. Jessica Sperling, Duke University
- Megan Gray, Duke University
- Ms. Medha Gupta, Thomas Jefferson High School for Science and Technology
- Ms. Amy Arnold, Duke University
- Monica Jenkins
- Kelly Perri, Duke University

**Computing Pathways: A Quantitative Inquiry into the Dynamic Pathways of Students in Computing with Gender Comparisons**

- Mrs. Maral Kargarmoakhar, Florida International University
- Mrs. Monique S. Ross, Florida International University
- Prof. Zahra Hazari, Florida International University
- Dr. Mark A Weiss, Florida International University
- Dr. Michael Georgiopoulos, University of Central Florida
- Dr. Ken Christensen P.E., University of South Florida
- Mrs. Tiana Solis, Florida International University

**Self-Efficacy Study in Computing Among College Freshmen**

- Mrs. Amrita Dhakal Ghimire, Mississippi State University
- Ms. Litany H. Lineberry, Mississippi State University
- Dr. Sarah B. Lee, Mississippi State University

**How a STEM Faculty Member’s Gender Affects Career Guidance from Others: Comparing Engineering to Biology and Physics**

- Dr. Eugene Judson, Arizona State University
- Lydia Ross, Arizona State University
- Prof. Stephen J. Krause, Arizona State University
- Prof. Keith D. Hjelmstad, Arizona State University
- Prof. Robert J. Culbertson
- Dr. Lindy Hamilton Mayled, Arizona State University
- Prof. James A Middleton, Arizona State University

**Gendered Professional Role Confidence and Persistence of Artificial Intelligence and Machine Learning Students**

- Miss Kimberly Ren, University of Toronto

**W352 - Community Engagement Division Technical Session 2**

10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE

**Sponsor: Community Engagement Division**

**Moderators: Nebojsa Sebastijanovic, Milwaukee School of Engineering; Margaret Pinnell, University of Dayton**

**Engagement in Practice (EIP): Differences in Perceptions between Engineering and Art Students in an Interdisciplinary Service-Learning Project**

- Dr. Yanjun Yan, Western Carolina University
- Prof. Mary Anna LaFratta, School of Art and Design, Western Carolina University
- Dr. Lane Graves Perry III, Western Carolina University
- Dr. Hugh Jack P.E., Western Carolina University

**Engagement in Practice: Exploring Boundary Spanning in a School-University Partnership**

- Dr. Julee Farley, Montgomery County Public Schools and Virginia Tech
- Dr. Lisa D. McNair, Virginia Tech

**Engagement in Practice: Adopting Service Learning and Community Engagement as a High Impact Teaching Strategy in Geotechnical Engineering**

- Dr. Simon Thomas Ghanat P.E., The Citadel
- Dr. William J. Davis P.E., The Citadel
- Dr. Dan D. Nale PE, The Citadel - Civil & Environmental Engineering
- Dr. Rebekah D. Burke, The Citadel

**Engagement in Practice: The SMU Maker Education Project**

- Dr. Rob Rouse, Southern Methodist University
- Mr. Juan Torralba, University of Miami
- Ms. Kathryn Krummeck
- DiMitri Higginbotham, Good Shepherd Episcopal School

**Work in Progress: Involving Teachers in International Community Engaged Learning Projects to Enhance their Understanding of Engineering and Intercultural Awareness**

- Dr. Margaret Pinnell, University of Dayton
- Dr. Kellie Schneider, University of Dayton
- Dr. Leanne Petry, Central State University
- Dr. M. Suzanne Franco, Wright State University
ASEE’S VIRTUAL CONFERENCE
WEDNESDAY, JUNE 24 SESSIONS

W356A - Military and Veterans Division Technical Session 1
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Military and Veterans Division

The Engineering Education Experiences of Students Serving in the Reserves or National Guard
- Dr. Catherine Mobley, Clemson University
- Mr. Joseph Murphy, University of California, Los Angeles
- Dr. Joyce B. Main, Purdue University, West Lafayette
- Dr. Catherine E. Brawner, Research Triangle Educational Consultants
- Dr. Susan M. Lord, University of San Diego

Development of Veteran-friendly Military Technology and Instrumentation Mechanical Engineering Course
- Dr. Jerry Lynn Dahlberg Jr, University of North Carolina at Charlotte
- Dr. Jae Hoon Lim, University of North Carolina at Charlotte
- Dr. Peter Thomas Tkacik, University of North Carolina at Charlotte

Assessing Department of Defense Demand for Veterans During and After Degree Completion
- Dr. Alyson Grace Eggleston, The Citadel
- Dr. Robert J. Rabb P.E., The Citadel

Virginia Digital Shipbuilding Program (VDSP): Building an Agile Modern Workforce to Improve Performance in the Shipbuilding and Ship Repair Industry
- Mr. Joseph Peter Kosteczko, Old Dominion University
- Ms. Katherine Smith, Old Dominion University
- Mrs. Jessica Johnson
- Dr. Rafael Diaz

W356B - Military and Veterans Division Technical Session 2
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Military and Veterans Division

The Impact of Veteran Students on the Academic Performance of Nonveteran Students
- Dr. Patrick Bass, The Citadel
- Dr. Nathan John Washuta P.E., The Citadel
- Mr. Donald L. Price, The Citadel

A Systems Engineering Approach to a Mentorship Program for Online Military and Veteran Engineering Students
- Dr. Reza Rahdar, Embry-Riddle Aeronautical University
- Dr. Ghazal Barari, Embry-Riddle Aeronautical University
- Dr. Yuetong Lin, Embry-Riddle Aeronautical University
- Mr. Ryan Goyings, Embry-Riddle Aeronautical University

Affirming Identity Through Authentic Mentoring in a Safe Space: Supporting Military Veterans in an Engineering Graduate Program
- Dr. Jae Hoon Lim, University of North Carolina at Charlotte
- Ms. Rachel Saunders, University of North Carolina at Charlotte
- Dr. Peter Thomas Tkacik, University of North Carolina at Charlotte
- Dr. Jerry Lynn Dahlberg Jr., University of North Carolina at Charlotte
- Miss Madison Elizabeth Levan, University of North Carolina at Charlotte

W357A - WIP It! Faculty Development Style!
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Faculty Development Division
Moderator: Margret Hjalmarson, George Mason University

This session highlights works in progress (WIPs) from the faculty development division! Come offer insights into future progress and see the newest projects we’re working on!

Certification and Training for Automation and Mechatronics
- Dr. Iftekhar Ibne Basith, Sam Houston State University
- Dr. Junkun Ma, Sam Houston State University
- Dr. Faruk Yildiz, Sam Houston State University

Design Thinking Approach to Identify Barriers to Engineering Education Reform in India
- Dr. Rucha Joshi, University of California, Davis
ASEE'S VIRTUAL CONFERENCE
WEDNESDAY, JUNE 24 SESSIONS

Dr. Jason R. White, University of California, Davis
Intercollegiate Coaching in a Faculty Professional Development Program that Integrates Pedagogical Best Practices and the Entrepreneurial Mindset
Dr. Heather Dillon, University of Portland
Dr. Lindy Hamilton Mayled, Arizona State University
Dr. Mark L. Nagurka, Marquette University
Dr. Maria-Isabel Carnasciali, University of New Haven
Dr. Douglas E. Melton, Kern Entrepreneurial Engineering Network

WIP: Virtual Writing Group Participation: Surprises & Unintended Outcomes
Dr. Lisa Bosman, Purdue University-Main Campus, West Lafayette (College of Engineering)
Dr. Erin J. McCave, University of Houston
Dr. Molly H. Goldstein, University of Illinois at Urbana - Champaign
Dr. Kelli L. Chelberg, College of Menominee Nation

W357B - Lessons Learned about Faculty Development!
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Faculty Development Division
Moderator: Abhishek Kumar, Northeastern University
Come hear about innovative efforts and lessons learned around faculty development!

Changing an Electrical and Computer Engineering Department Culture from the Bottom Up: Action Plans Generated from Faculty Interviews
Elise A. Frickey, Iowa State University
Dr. Diane T. Rover, Iowa State University
Prof. Joseph Zambreno, Iowa State University
Prof. Ashfaq Khokhar, Iowa State University
Dr. Douglas W. Jacobson, Iowa State University
Dr. Lisa M. Larson Ph.D., Iowa State University
Prof. Mack Shelley, Iowa State University of Science and Technology

Lessons Learned in Implementing Increased Support and Building Academic Community for Teaching Faculty
Dr. Heidi Marie Sherick, University of Michigan
Dr. Pauline Khan, University of Michigan
Dr. Elizabeth J. Bailey, University of Michigan

Lessons Learned in Professional and Identity Development as Part of a Teaching Assistant Training Program
Ms. Erica Jean Hagen, University of Wisconsin, Madison
Ms. Elizabeth C. Harris, University of Wisconsin-Madison

Lessons Learned: Integrating Active Learning into Undergraduate Engineering Courses
Dr. Emily Peterek Bonner
Dr. Vittorio Marone, The University of Texas at San Antonio
Dr. Timothy Yuen, The University of Texas at San Antonio
Mrs. Robin Nelson, University of Texas at San Antonio
Dr. JoAnn Browning P.E., The University of Texas at San Antonio

W360A - FOCUS ON EXHIBITS: Virtual Showcase
12:00 P.M. - 1:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: ASEE Headquarters
Live interaction with sponsors and exhibitors.

W360B - Engineering and Engineering Technology Chairs Open Exchange
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: ASEE Headquarters
This interactive session serves as an exclusive forum for engineering and engineering technology chairs and department heads to exchange ideas, talk through challenges, and build new working relationships. The bulk of the session will be dedicated to small-group roundtable discussions on topics of interest suggested by 2019 Chairs Conclave participants, including faculty evaluations, conflict mediation and resolution, and working with deans and administrators. Come prepared to have open discussions, share knowledge, resources, and best practices, and build relationships with new and seasoned department chairs and heads. Note: This session is only open to engineering and engineering technology chairs and department heads. Learn more at https://chairsconclave.asee.org.
ASEE’S VIRTUAL CONFERENCE
WEDNESDAY, JUNE 24 SESSIONS

W371A - NSF Grantees: Design
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: NSF Grantees Session
Moderator: Sarah Ryan, Iowa State University of Science and Technology

Presentations from groups with current NSF-funded projects focused on the role of design in engineering education.

Using Design to Understand Diversity and Inclusion within the Context of the Professional Formation of Engineers

- Dr. Carla B. Zoltowski, Purdue University at West Lafayette
- Dr. Andrew O. Brightman, Purdue University at West Lafayette
- Prof. Patrice Marie Buzzanell, University of South Florida
- Dr. Sean Eddington, Kansas State University
- Dr. Danielle Corpble, Wheaton College
- Memoria Matters, Purdue University at West Lafayette
- Ms. Virginia Lynn Booth-Womack, Purdue University at West Lafayette

Understanding Student Conceptualizations of the Market Context in Engineering Design

- Dr. Steven Hoffenson, Stevens Institute of Technology
- Dr. Nicole P. Pitterson, Virginia Polytechnic Institute & State University
- Jessica Rose Driscoll, Stevens Institute of Technology

Research Initiation: Enhancing the Learning Outcomes of Empathic Innovation in Biomedical Engineering Senior Design Projects

- Dr. Nan Kong, Purdue University at West Lafayette
- Dr. Senay Purzer, Purdue University at West Lafayette
- Dr. Lindsey B. Payne, Purdue University at West Lafayette
- Mrs. Eunhye Kim, Purdue University at West Lafayette
- Carolina Vivas-Valencia, Purdue University

Scaling Informal Technology Education through Maker Spaces

- Dr. Foad Hamidi, University of Maryland, Baltimore County
- Shawn Grimes
- Stephanie Grimes
- Ms. Adena Moulton, Digital Harbor Foundation
- Andrew Coy, Digital Harbor Foundation

W371B - NSF Grantees: Student Learning 1
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: NSF Grantees Session
Moderators: Amber Genau, University of Alabama at Birmingham; Gregory Mason, Seattle University

Presentations from groups with current NSF-funded projects focused on the development of tools and courses to improve student learning.

Course Redesign – Embedding High-impact Practices (HIPS) in STEM Courses

- Dr. Huanying "Helen" Gu, New York Institute of Technology
- Dr. N. Sertac Artan, New York Institute of Technology
- Dr. Ziqian Dong, New York Institute of Technology
- Prof. Reza Amineh, New York Institute of Technology
- Dr. Houwei Cao, New York Institute of Technology
- Dr. Sarah McPherson, New York Institute of Technology

Understanding Context: Propagation and Effectiveness of the Concept Warehouse in Mechanical Engineering at Five Diverse Institutions and Beyond – Results from Year 1

- Dr. Brian P. Self, California Polytechnic State University, San Luis Obispo
- Prof. Dominic J. Dal Bello, Allan Hancock College
- Dr. Milo Koretsky, Oregon State University
- Dr. Susan Bobbitt Nolen, University of Washington
- Dr. Christopher Papadopoulos, University of Puerto Rico, Mayaguez Campus
- Dr. Michael J. Prince, Bucknell University
- Dr. James M. Widmann, California Polytechnic State University, San Luis Obispo

Crowdsourcing Classroom Observations to Identify Misconceptions in Data Science

- Prof. Ruth E. H. Wertz, Valparaiso University
- Prof. Karl R.B. Schmitt, Valparaiso University
- Dr. Linda Clark, Brown University
- Prof. Bjorn Sandstede, Brown University
- Dr. Katherine M. Kinnaird, Smith College

Multidisciplinary Research and Teaching by Means of Employing FTIR Spectroscopic Imaging System and Characterization Techniques

- Dr. Zahrasadat Alavi, California State University, Chico

The Broader Impacts of an Additive Manufacturing Course at Three Large Universities

- Dr. Patricia Ann Maloney, Texas Tech University
- Dr. Weilong Cong, Texas Tech University
- Dr. Meng Zhang, Kansas State University
- Dr. Bingbing Li, California State University, Northridge
ASEE’S VIRTUAL CONFERENCE
WEDNESDAY, JUNE 24 SESSIONS

W371C - NSF Grantees: Student Learning 2
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: NSF Grantees Session
Moderators: Amber Genau, University of Alabama at Birmingham; Brian Self, California Polytechnic State University, San Luis Obispo

Presentations from groups with current NSF-funded projects focused on the development of tools and courses to improve student learning.

Accelerated Learning and Assessment in Engineering Mechanics: Designing an Interactive Tool to Support Students’ Learning

- Dr. Nicole P. Pitterson, Virginia Polytechnic Institute and State University
- Dr. Jacob R. Grohs, Virginia Polytechnic Institute and State University
- Prof. David A. Dillard, Virginia Polytechnic Institute and State University
- Dr. Sneha Patel Davison, Virginia Polytechnic Institute and State University
- Mr. Todd P. Shuba, Virginia Polytechnic Institute and State University
- Prof. Cliff Shaffer, Virginia Polytechnic Institute and State University
- Mr. Arinjoy Basak, Virginia Polytechnic Institute and State University
- Mr. Jianqiang Zhang, Virginia Polytechnic Institute and State University

Interactive Editing of Circuits in a Step-based Tutoring System

- Dr. Brian J. Skromme, Arizona State University
- Caleb Redshaw, Arizona State University
- Mr. Abhishek Gupta
- Mr. Shatruhn Gupta, Arizona State University
- Prof. Petru Andrei, Florida A&M University/Florida State University
- Dr. Hector Erives, University of Texas at El Paso
- Mary White
- Dr. DeAnna Bailey, Morgan State University
- Dr. Willie L. Thompson II, Morgan State University
- Dr. Srividya Kona Bansal, Arizona State University
- Wendy M. Barnard, Arizona State University

Comparing Students’ Solutions to an Open-ended Problem in an Introductory Programming Course with and without Explicit Modeling Interventions

- Dr. Kelsey Joy Rodgers, Embry-Riddle Aeronautical University - Daytona Beach

Dr. Matthew A. Verleger, Embry-Riddle Aeronautical University - Daytona Beach
Dr. Farshid Marbouti, San Jose State University
The Sequential Nature of Engineering Problem Solving
Dr. Carolyn Plumb, Montana State University
Rose M. Marra, University of Missouri - Columbia
Dr. Douglas J. Hacker

W371D - NSF Grantees: Student Learning 3
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: NSF Grantees Session
Moderators: Amber Genau, University of Alabama at Birmingham; Clara Novoa, Texas State University

Presentations from groups with current NSF-funded projects focused on improving student learning through reflection and teamwork.

Assessment of Reflective and Metacognitive Practices for Electrical and Computer Engineering Undergraduates

- Dr. Samuel J. Dickerson, University of Pittsburgh
- Dr. Renee M. Clark, University of Pittsburgh
- Mr. Nan Jiang

Reflection in Engineering Education: Advancing Conversations

- Dr. Jennifer A. Turns, University of Washington
- Kenya Z. Mejia, University of Washington
- Dr. Cynthia J. Atman, University of Washington

The Role of Teaching Assistants and Faculty in Student Engagement

- Dr. Denise Wilson, University of Washington

Optimizing Student Team Skill Development Using Evidence-based Strategies: Year 5

- Dr. Matthew W. Ohland, Purdue University at West Lafayette
- Dr. Misty L. Loughry, Rollins College
- Dr. David J. Woehr, University of North Carolina, Charlotte
- Dr. Daniel M. Ferguson, Purdue University at West Lafayette
- Dr. Catherine E. Brawner, Research Triangle Educational Consultants
- Mr. Behzad Beigpourian, Purdue University at West Lafayette
- Mr. Siqing Wei, Purdue University at West Lafayette

Interpersonal Interactions in Engineering Teams: Findings from a Multi-year Mixed Methods Study at Three Institutions

- Mr. Héctor Enrique Rodríguez-Simmonds, Purdue University at West Lafayette
- Tara C. Langus, University of Nevada, Reno
- Mr. Nelson S. Pearson, University of Nevada, Reno
W399A - SPONSOR TECHNICAL SESSION: How to Implement Online Hands-on Classes During the Time of COVID-19 - Presented by STMicroelectronics

11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Sponsored Sessions

The current pandemic is putting our education system under strain, and this creates a greater need to accelerate the implementation of online teaching to ensure the continuity of programs and student engagement. This session will explore different approaches of hands-on, online curricula for IoT, embedded machine learning, low-level firmware programming, and motor control developed by Prof. Kaiser (UCLA) and Prof. Zhu (Univ. of Maine). This content is now available on www.st.com/educationalplatforms.

W399B - SPONSOR TECHNICAL SESSION: Innovation in Engineering Education - Fusing Electromagnetic Simulations with Theory and Experiments in Antenna and Wireless Communication Courses - Presented by Altair

10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Sponsored Sessions

Moderator: Dr. C. J. Reddy, Altair Engineering

Speaker: Dr. C. J. Reddy, Altair

Dr. C.J. Reddy is the Vice President of Business Development with more than 30 years of experience in the RF, Antenna, Microwave, and electromagnetic simulation industry. Dr. Reddy is a Fellow of IEEE, the Applied Computational Electromagnetics Society (ACES), and the Antenna Measurement Techniques Association (AMTA).

In the field of engineering, theoretical analysis is of paramount importance in understanding the basics. This is the focus of most of the engineering education providing students with a deeper theoretical knowledge of necessary concepts. Students are also expected to learn physical phenomenon through experimentation while instructors explain the theory behind the experiment. While this process enhances the analytical capability of the students, it has been difficult to duplicate complex real-life problems during classroom instruction. With the advent of advanced engineering simulation technology and the availability of powerful, inexpensive computers, it is now possible to enhance engineering education. It can now include complex real-life problems in addition to providing analytical capability to students.

In this session, we will present Altair’s advanced electromagnetic simulation tools for antenna design wireless communication courses. While the basic concept of antennas for transmitting and receiving radio frequency (RF) signals is well known, closed-form exact analytical solutions to many antenna problems are not possible. Following the theoretical analysis methods, several approximations are typically made to simplify and solve the problem, but this consequently limits the accuracy of the solution. Almost exact solutions to antenna problems can be obtained using simulation tools such as Altair Feko, incorporating advanced numerical methods. The effective utilization of electromagnetic simulations for real-life antenna configurations provides students with not only the guidelines for antenna design simulations, but also an illustrative visualization of antenna radiation patterns, radiating currents, and other characteristics that will be very beneficial for both educational purposes and practical applications. During this session, we will also present case studies of how electromagnetic simulations are successfully fused with theory and experiments by educators at different universities.

W399C - SPONSOR TECHNICAL SESSION: Hands-on, Project-based Learning with Digital Twins for Mechatronics in Engineering Education and Research - Presented by Altair

11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Sponsored Sessions

Moderator: Keshav Sundaresh, Altair Engineering

Speaker: Keshav Sundaresh, Altair

Keshav Sundaresh is the Global Director of Smart Systems, Mechatronics, and Robotics with over 15 years of experience in Multi-body Dynamics, Math and System Simulation domain. In this leadership role, he’s responsible for driving technical and business partnerships by teaming with product development, global sales and channels, marketing and customers.

In this age of the Internet of Things, Big Data, analytics and mechatronics, it is the multidisciplinary intersections of mechanical, electrical, and control systems that provide the product and experience opportunities the marketplace is seeking for applications ranging from autonomous vehicles to wearable devices. Whether you’re teaching/learning introductory
controls, mechanical dynamics, or higher-level mechatronics courses, seamlessly integrating engineering concepts with actual hardware is key for students to get premium mechatronics jobs in the industry.

In this technical session, we will demonstrate a comprehensive Mechatronics educational kit to teach and learn model-based development with the highest fidelity digital twin simulations. With this kit, you’ll be able to study system dynamics and automated control concepts, integration of high-fidelity controllers modeled in Altair Activate - an open integration platform for system simulations with high-fidelity mechanical systems (/plants) modeled in Altair MotionSolve - a high-fidelity 3D Multi-body Dynamics simulation environment. Furthermore, you’ll learn virtual commissioning of real platform via digital twin combined with optimization of the controller gains with different operating conditions and controller types.

Balancing a ball on a table in a desired position is one of the most important and classical problems of control theory. In this tech session, we’ll use this example and go through the workflow of digital twin simulations combined with hands-on experiments. If you wish to receive a free copy of the digital twin simulation models and reports, please reach out to Keshav at https://www.linkedin.com/in/keshavsundaresh/.

W401 - K-12 Experience in Aerospace Engineering

1:00 P.M. - 1:30 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsors: Aerospace Division; Pre-College Engineering Education Division

Moderators: Michael Hatfield, University of Alaska Fairbanks; Nadir Yilmaz, Howard University

Speakers: Dr. Garrett Ramon Love, North Carolina School of Science and Math; Dr. Kuldeep S. Rawat, Elizabeth City State University; Dr. Vemitra M. White, NASA EPDC; Mrs. Paula Mae McElroy, Marlette High School

W411A - Joint Panel: Leveraging Experiential Education to Become an International Engineering Education Leader

1:00 P.M. - 1:30 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Cooperative and Experiential Education Division

Moderators: Robin Hammond, Arizona State University; Katherine McConnell, University of Colorado Boulder

Speakers: Prof. Anette Kolmos, Aalborg University; Aldert Kamp, TU Delft

Given industry feedback and recent engineering accreditation changes, STEM educators have been driving curricular changes to better meet the needs of student populations and surrounding business communities. As a result, higher learning institutions, particularly in the STEM fields, have been implementing proactive and innovative steps to design and deliver a curriculum that is outcomes-based, provides discipline-specific knowledge, and is informed by real-world business needs and applications.
Given the recent focus on emerging technologies, the anticipated shift in engineering education is toward more socially relevant, outward-facing engineering curricula. Such curricula emphasize multidisciplinary learning, societal impact, experiential learning (within and outside of the traditional classroom), and a global mindset. The discussion will introduce the global, legal, economic, environmental, and societal impacts of vehicle autonomy and electrification, and include an overview of some of the following impact areas: workforce disruption, driver safety, industry shifts, and educational training. The session will focus on the values of a liberal arts education in developing solutions for 21st-century industry shifts, and educational training. Such curricula emphasize multidisciplinary learning, societal impact, experiential learning (within and outside of the traditional classroom), and a global mindset. The discussion will introduce the global, legal, economic, environmental, and societal impacts of vehicle autonomy and electrification, and include an overview of some of the following impact areas: workforce disruption, driver safety, industry shifts, and educational training. The session will focus on the global, legal, economic, environmental, and societal impacts of vehicle autonomy and electrification, and include an overview of some of the following impact areas: workforce disruption, driver safety, industry shifts, and educational training.

- Global, legal, economic, and environmental impact of vehicle autonomy and electrification
- Growth in vehicle autonomy/electrification in various mobility forms
- Explosion of data-driven software development
- Innovation in vehicle design (electric, composite bodies that are 3-D printed)
- Societal disruption involving vehicle operation/parking, auto industry employment, privacy, and business models.
Engineering Education and as an education researcher to identify parallels between scholarship in engineering education and our approaches to transformational change in engineering education. In scoping out a few current topics in engineering education research, I will highlight – perhaps most importantly – the issue of access to engineering education scholarship and the ways our community reflects its values and beliefs through its scholarly work as well as its actions related to sharing and building on that work.

**W416 - DISTINGUISHED LECTURE: Smart Energy: Opportunities and Challenges**

2:00 P.M. - 2:30 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsors: Energy Conversion and Conservation Division; Mechanical Engineering Division; Instrumentation Division; Ocean and Marine Division

Moderators: Lynn Albers, Hofstra University; Maryam Younessi Sinaki

Speaker: Dr. Yunus A. Cengel P.E., University of Nevada, Reno

The world is entering into the "smart everything" age, and energy is no exception. Artificial intelligence (AI) is forming the new platform for tomorrow’s products, services, work environments, and the workforce. Data literacy is becoming an essential cross-cutting skill. Power grids are to be replaced by smart grids where electric generation plants, consumer devices, and storage systems are connected and supply-and-demand analyses are made. To survive in this high-tech environment, the society at large will have to embrace change and acquire new skills associated with society 5.0. The future engineers will have to develop a creative mindset and focus on producing original ideas and inventing new goods and services.

**W428 - Challenges and Opportunities in Graduate Education**

1:00 P.M. - 1:30 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Graduate Studies Division

Moderator: Jeffrey Fergus, Auburn University

Speakers: Dr. La'Tonia Stiner-Jones, Ohio State University; Mr. Eric Holloway, Purdue University at West Lafayette; Dr. Tremayne O'Brian Waller, Virginia Polytechnic Institute and State University; Dr. Jim A. Nicell, Ing., McGill University

Overall, the number of graduate and doctorate degrees awarded in the U.S. has grown over the course of the early 21st century. Fields like engineering and education have been producing Ph.D.’s for several decades. However, recent shifts in technology have changed the Ph.D. process drastically. The specific new field of a Ph.D. in engineering education came formally into existence in 2004 with the creation of Purdue’s School of Engineering Education, with other programs debuting since then. Other, less formalized Ph.D. pathways in engineering education also have appeared, expanding the possibilities of Ph.D. study. Thus, the process of graduate school, while familiar to many academics, is also always becoming new, and it is important to update and reiterate advice to reflect those new realities.

This panel session aims to bring together new faculty in EER and related roles to share their experiences and advice for getting through graduate school.
W448 - The Many Facets of Cyber- and Systems-security Engineering Education

1:00 P.M. - 1:30 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsors: Systems Engineering Division; Multidisciplinary Engineering Division; Computing and Information Technology Division; Software Engineering Division; Electrical and Computer Division

Moderator: Alice Squires, International Council on Systems Engineering

Speakers: Dr. Radu F. Babiceanu, Embry-Riddle Aeronautical University - Daytona Beach; Dr. Richard E. Fairley, Systems and Software Engineering Associates (S2EA); Dr. Douglas W. Jacobson, Iowa State University of Science and Technology; Dr. Peggy Brouse, George Mason University

Cybersecurity is a systems challenge to ensure integrity, confidentiality, and accessibility of data under adverse circumstances. We find cybersecurity engineers across many domains, from power systems to aerospace to information technology and more, whose primary responsibility is to identify and mitigate vulnerabilities in the operational systems. This panel will explore cybersecurity from multiple perspectives, including how current educational programs are meeting the new ABET cybersecurity criteria, where cybersecurity programs can be found in the university (e.g. systems engineering, information technology, computer science, electrical and computer engineering, or other), how systems engineering educators are integrating cybersecurity into the curriculum, what other approaches have been used to deliver cybersecurity education, the role of professional societies such as the International Council on Systems Engineering (INCOSE) in cybersecurity education and training, and how cybersecurity programs are meeting cyber workforce demands. All the panelists are active leaders and faculty members in cybersecurity programs at their universities.

W458A - DISTINGUISHED LECTURE: 2019 Best PIC and Zone Papers Live Q&A

2:00 P.M. - 2:30 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: ASEE Board of Directors

Moderator: Peter Schmidt, University of Evansville

Featuring the 2019 Best PIC and Zone Paper Winners

Best Overall 2019 PIC Paper and PIC II Winner - Assessment of Project-based Learning Courses Using Crowd Signals

Mr. Georgios Georgalis, Purdue University at West Lafayette
Dr. Karen Marais, Purdue University at West Lafayette

Best Overall 2019 Zone Paper and Zone 1 Winner - Implementation and First-year Results of an Engineering Spatial-skills Enhancement Program

Dr. Alexander John De Rosa, Stevens Institute of Technology
Dr. Maxine Fontaine, Stevens Institute of Technology


Dr. Lindy Hamilton Mayled, Arizona State University
Lydia Ross, Arizona State University
Dr. Casey Jane Ankeny, Northwestern University
Prof. Jay Oswald, Arizona State University

Best 2019 PIC III Paper: Do They Understand Your Language? Access Their Fluency with Vector Representation

Eric Davishahl, Whatcom Community College
Todd Haskell, Western Washington University
Ms. Jill Davishahl, Western Washington University
Dr. Lee Singleton, Whatcom Community College
Dr. Wade H. Goodridge, Utah State University

Best 2019 PIC IV Paper: Students’ Views on Their Role in Society as an Engineer and Relevant Ethical Issues

Dr. Angela R. Bielefeldt, University of Colorado Boulder
Mr. David Zhao
Alexandra Kulich
Dr. Madeline Polmear, University of Florida
Dr. Nathan E. Canney
Dr. Chris Swan, Tufts University
Dr. Daniel Knight, University of Colorado Boulder

Best 2019 PIC V Paper: Mapping and Strengthening Curriculum-based Industry/Academia Intersections

Dr. Katherine McConnell, University of Colorado Boulder

Best 2019 Zone II Paper: Research to Practice: Leveraging Concept Inventories in Statics Instruction

Prof. Ruth Wertz P.E., Valparaiso University
Theresa Green, Utah State University

Best 2019 Zone III Paper: Blended Learning: Electrical Circuits for Non-EE Students

Dr. Amardeep Kaur, Missouri University of Science and Technology
Dr. Theresa Mae Swift, Missouri University of Science and Technology

Best 2019 Zone IV Paper: Assessing Student Assessment in a Flipped Classroom

Dr. Bryan Mealy, California Polytechnic State University, San Luis Obispo
W458B - 2020/2021 Nominating Committee - by invitation only
1:30 P.M. - 3:00 P.M.
Sponsor: ASEE Board of Directors

Be advised, this meeting will be held separately from the Virtual Annual Conference. Details will be sent directly to committee members.

W460 - DISTINGUISHED LECTURE: Learning Spaces and Teaching Choices
2:00 P.M. - 2:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: ASEE Headquarters
Moderator: Nathan Kahl, American Society for Engineering Education;
Speaker: Dr. Susan McCahan, University of Toronto

Active learning classrooms are now a common feature at many higher education institutions. They are also rapidly blending the physical and virtual worlds to create new types of hybrid learning experiences. While these continue to be created, it is not always the case that faculty are engaged in the design process. However, faculty participation can make a significant difference in the design of learning spaces, and participation by faculty and students in the process is a means of engendering uptake of active pedagogy. Classroom space, which was largely static and relatively unstudied, is undergoing a renaissance both in terms of creative design and scholarly investigation. In her presentation, Prof. Susan McCahan will discuss the history of formal university classrooms and how we arrived at active-learning space design. She will describe an example of participatory design and the outcomes from that process.

W477A - ASEE CDEI Best Diversity, Equity, & Inclusion Paper Award Finalist Presentations
1:00 P.M. - 1:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: ASEE Commission on Diversity, Equity, & Inclusion
Moderators: Elizabeth Litzler, University of Washington; Jenna Carpenter, Campbell University
Speaker: Dr. Susan E. Walden, University of Oklahoma

Now in its sixth year, the ASEE Best Diversity, Equity, & Inclusion Paper Award seeks to identify highly impactful research or programs published at an ASEE conference that help address inequities in engineering and influence the inclusive, diverse future of engineering. Diversity dimensions addressed can include (but are not limited to): age, belief system, disability status, ethnicity, gender, gender identity, gender expression, national origin, race, sexual orientation, socioeconomic status, and any other visible or non-visible differences.

Nominated DEI papers and presentations are assessed for a) the extent of inclusivity and focus on diversity, equity, and/or inclusion; b) novelty of approaches/ideas/interventions; c) depth and extent of connection with existing literature and/or theory; d) demonstrated or potential impact; and e) communication effectiveness. The ASEE Best Diversity, Equity & Inclusion Paper rubric is used by an ASEE CDEI Paper Selection Committee to assess these scholarly attributes of the nominated manuscripts and to identify approximately five finalists.

The finalists present their work in this session (in addition to their original Annual, Section, or Zone conference) for additional evaluation by the Committee. The Award recipient is selected based on the sum of the two evaluations.

This year’s finalists are:

- Faculty Development Mini-Modules on Evidence-Based Inclusive Teaching and Mentoring Practices in Engineering, by S. Ilkhanipour Rooney, Joshua A. Enzser, Julia A. Maresca, S. Ismat Shah, Sheldon Allister Hewlett, and Jenni M. Buckley (Faculty Development Division)
- How Does Enrollment Management Affect Student Population Diversity in Biomedical Engineering? by Rachel C. Childers and Handan Acar (Biomedical Engineering Division)
- A Review of the State of LGBTQIA+ Student Research in STEM Faculty Hiring, by Samara Rose Boyle, Canek Phillips, Yvette E. Pearson, Reginald DesRoches, Stephen Mattingly, Anne Nordberg, Wei Wayne Li, and Hanadi S. Rifai (Minorities in Engineering Division)

Finalists’ names will be published on the CDEI website (https://diversity.asee.org/deicommittee/win-an-award/)

W477B - DISTINGUISHED LECTURE: Indigeneering Engineering Education: Welcoming Indigenous Knowledge and Wisdom with Integrity
2:00 P.M. - 2:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsors: ASEE Commission on Diversity, Equity & Inclusion; Engineering Ethics Division; International Division; Liberal Education/Engineering & Society Division; Minorities in Engineering Division; Engineering Technology Council
Moderator: Susan Walden, University of Oklahoma
Speakers: Deanna Burgart, Schulich School of Engineering, University of Calgary; Dr. Susan E. Walden, University of Oklahoma

A transforming world invites us to change our mindset and consider more innovation, more collaboration, and greater co-creation. Ecosystems of innovators, technical specialists, and humanitarians are growing to help find solutions to global challenges. Deanna Burgart, indigeneer, believes that greater incorporation of diverse perspectives, including indigenous
perspectives and worldviews, can be a catalyst to finding solutions in a
more meaningful, long-term way.

As indigenous perspectives are sought, and indigenous knowledge is
captured, the importance of creating an ethical understanding on how to
do this in a good way is imperative. Deanna will introduce participants to:

- Indigenous Ways of Knowing, Being, and Doing

This section will describe the results of a two-day retreat held for
indigenous and non-indigenous STEM professionals, educators, and
community members exploring the best ways to support and inspire
indigenous youth to pursue STEM careers.

- Cultural Appropriation and Commodification of Indigenous Ways of
  Knowing

This section will define sacred indigenous knowledge and illustrate the
difference between sacred indigenous knowledge and personal knowledge.
We will summarize a literature review and examine incidents of cultural
appropriation as a means to inform.

- Introduction to Indigenous Self-determination with Respect to
  Knowledge and Data Protection

A look at how to protect indigenous knowledge going forward. Participants
will be called on in a discussion activity on how to best do this in any
work seeking to include indigenous perspectives as a response to the
United Nations Declaration on the Rights of Indigenous Peoples.

Deanna will use her own stories and examples of initiatives of indigenous
inclusion in innovation to invite and inspire participants to join her
in seeing a future that invites more indigenous voices to engineering
education and solutions for all. She will invite all to explore how we can
bring indigenous perspectives to the engineering education landscape in
an ethical space of cultural safety that protects the integrity of Indigenous
beliefs and worldviews.

Participants will leave feeling empowered to listen, learn, and grow
with the wisdom of indigenous peoples they are fortunate to meet on
their journey.

W479 - ABET Criteria and
Opportunities for Inclusion in
Engineering Education
1:00 P.M. - 1:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: ABET Sponsored Sessions
Moderator: Tom Walker,
Speaker: Dr. Yvette E. Pearson P.E., Rice University

Beginning in Fall 2019, programs undergoing review by the Engineering
Accreditation Commission (EAC) of ABET are being evaluated based on
recently revised criteria. ABET is never prescriptive about how programs
choose to meet the requirements; its review process is designed to assure
programs meet quality standards set forth in the EAC criteria and the
Accreditation Policy and Procedure Manual, known as the APPM. The
changes to EAC General Criteria create a number of opportunities to
modify our traditional approaches to educating future engineers so they
are not only aware of the need to practice engineering in an inclusive
manner but are also equipped to do so.

This session will highlight ABET EAC criteria changes that promote
diversity, equity, and inclusion along with strategies for addressing them
in ways that support the attainment of EAC Criterion 3 Student Outcomes.
Connections will be made to various engineering codes of ethics (e.g.,
NSPE, ASCE, IEEE, AIChe) as appropriate.
W503 - BAE Division Business Meeting
3:30 P.M. - 4:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Biological and Agricultural Engineering Division
BAE Division Business Meeting

W510 - CPDD Executive Board Meeting
3:30 P.M. - 4:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Continuing Professional Development Division
Business meeting of the Continuing Professional Development Division Executive Board

W518 - Engineering Design Graphics Division Business Meeting
3:30 P.M. - 4:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Design Graphics Division
Business meeting of the Engineering Design Graphics Division, moderated by the chair, Heidi M. Steinhauer.

W520 - Engineering Ethics Division Business Meeting
2:30 P.M. - 3:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Ethics Division

W521 - Engineering Libraries Division Annual Business Meeting
3:30 P.M. - 4:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Libraries Division
Welcome to all ELD members. Come hear about the state of the division and Professional Interest Council IV. Moderated by Julie Cook, ELD Division Chair.

W523B - Tau Alpha Pi Meeting
3:30 P.M. - 4:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Technology Division
Annual meeting of the ET honor society.

W523C - Engineering Technology National Forum
2:30 P.M. - 3:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsors: Engineering Technology Division; Engineering Technology Council
ETNF Business meeting

W527 - First-Year Programs Officers Meeting
2:30 P.M. - 3:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: First-Year Programs Division
A convening of the Officers of the First-Year Programs Division to conduct business. By invitation.

W529 - Industrial Engineering Division Town Hall Business Meeting
2:30 P.M. - 3:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Industrial Engineering Division

W536 - Materials Division Meeting
2:30 P.M. - 3:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Materials Division
Business Meeting

W539 - Hands-on Mechanics
3:30 P.M. - 4:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Mechanics Division
Moderators: Devin Berg, University of Wisconsin - Stout; Carisa Ramming, Oklahoma State University
Mechanics educators will give a demonstration of the hands-on activities they have developed and/or used in engaging students and enhancing the learning outcomes in mechanics courses.
W542 - How Should I Teach? Perspectives and Discussions on What Works for Your Peers in an Engineering Classroom
3:30 P.M. - 4:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: New Engineering Educators Division
Moderators: Jaskirat Sodhi, New Jersey Institute of Technology; Kerry Widder, Milwaukee School of Engineering
Speaker: Dr. Vimal Kumar Viswanathan, San Jose State University

New engineering educators typically enter academia with very limited or no training in classroom instruction. Many educators find it very hard to organize their classes in an effective way and to keep students engaged in the course materials. With the abundance of literature on the pros and cons of various educational pedagogies, new educators might feel overwhelmed. This panel is designed as a platform to share the experiences of educators who have tried various pedagogies. The participants will hear from both new and experienced educators about what works for them and what does not. The participants will also be able to share their experiences. This discussion is not designed to answer all the questions but to provide a starting point for those who are beginning their career in academia. Participants will be able to ask open-ended questions and hear the perspectives of the panelists and other participants in the room.

Who should attend? Current or prospective faculty who wish to learn more about the educational practices that worked for their peers.

W544 - Ocean and Marine Engineering Division Business Meeting
2:30 P.M. - 3:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Ocean and Marine Division

W547 - Student Division Business Meeting
2:30 P.M. - 3:30 P.M., ONLINE, A VIRTUAL CONFERENCE
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.

W548 - SED Business Meeting
3:30 P.M. - 4:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Systems Engineering Division

This is the business meeting of the Systems Engineering Division.

W549 - TELPhE Division Business Meeting
3:30 P.M. - 4:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Technological and Engineering Literacy/Philosophy of Engineering Division

This is the annual business meeting of the Technological and Engineering Literacy/Philosophy of Engineering (TELPhE) Division. Election of officers will be held, and discussion of future action items will take place.

W555 - LEAD Division Business Meeting
3:30 P.M. - 4:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Leadership Development Division

W557A - Ways that Teaching and Learning Centers Work: Sharing Lessons Learned
2:30 P.M. - 3:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Faculty Development Division
Moderators: Sarah Zappe, Pennsylvania State University; Stephanie Cutler, Pennsylvania State University; Sam Spiegel, Colorado School of Mines
Speakers: Dr. Sam Spiegel, Colorado School of Mines; Dr. Sarah E. Zappe, Pennsylvania State University

Faculty development and teaching and learning centers are gaining more attention in the STEM fields as more focus is placed on innovations in teaching. For some faculty, that means moving towards more modern approaches. Others may be on the fringe of trying new approaches. [1, 2]. This session will bring together ASEE members who are involved in faculty development, either through a formal teaching and learning center or through less formal structures. We will utilize a Center for Teaching and Learning Matrix (T and L Matrix) [3] published by the American Council on Education and the POD network as a reference to consider the ways that different centers work, to identify varying strengths and growth areas, and to provide an opportunity to share strategies or challenges as a whole group. We will share common ways and variations that Teaching and Learning Centers work, using the Trefny Innovative Instruction Center at the Colorado School of Mines and the Leonhard Center for Enhancement of Engineering Education at Penn State as structured examples. There will also be opportunities for participants to network, learn from each other, and define challenges or areas that warrant further study.
By the end of this session, learners will be able to:

1. Utilize a Center for Teaching and Learning Matrix (T and L Matrix) published by the American Council on Education and the POD network to conduct a self-analysis of your center/FD efforts

2. Identify at least one strategy you can use to enhance one or more domains from the T and L Matrix in your faculty development work

3. Articulate common ways and variations in the way Teaching and Learning Centers work, using the Trefny Innovative Instruction Center at the Colorado School of Mines and the Leonhard Center for Enhancement of Engineering Education at Penn State as structured examples

4. Articulate what is going well in your Teaching and Learning Center or faculty development efforts

5. Articulate challenges and key barriers you face (other than money and time) in your faculty development efforts

6. Articulate what you would like to learn from other centers and possible research areas

7. Establish new network relationships and possible partners for collaboration

We will begin with a short activity that gives participants a chance to get to know each other. We will then utilize the T and L Matrix so participants can conduct a self-analysis of their center and/or faculty development efforts. For time considerations, we will focus the self-analysis on six domains from the Matrix. We will share the Trefny and Leonhard Centers self-assessments and lessons learned. The participants will also share the ways that their centers, or centers they know about, work. We will follow the content and flow outlined in the table below. For each activity we note the Learning Goal (LG) being addressed.

Post-tenure review (PTR) is a mechanism that universities are increasingly using to evaluate faculty over a regular time period after they have attained tenure. While there has been mention of PTR in papers at previous ASEE conferences, we want to initiate a new public dialogue about the impact of PTR on departments and engineering colleges. It is unknown how many colleges of engineering have PTR and the potential impact on the perceptions of academic freedom, risk-taking, workload, culture, climate and collegiality. The purpose of this interactive session is to engage faculty and administrative leadership in a discussion of the aforementioned issues.

Improved clarity on the relationship between faculty and administrators with PTR could result in strategic faculty development roadmaps. In an era of evolving rules and practices, gauging the current state of this review mechanism will assist engineering faculty in engaging with policy development at their home institutions. Several aspects of PTR vary among institutions, including: (i) frequency of the review (e.g., 3-5 years); (ii) constitution of departmental-, college-, and university-level committees; (iii) rating systems; and (iv) required professional development plans.

This session will explore: (i) the potential role of ASEE in a survey of COE on the topic of PTR; (ii) the longer-term needs of understanding the positive and negative impacts of PTR on climate; and (iii) the importance of career planning/roadmapping on PTR. The ultimate long-term goal is to empower post-tenure faculty to incorporate these reviews into their overall career roadmaps. The new faculty development group in ASEE
is in a unique position to coalesce and disseminate best practices for PTRs—often mandated by a university system—into the fabric of COEs and ultimately into the academic career of our faculty.

Session learning goals:

1. Equip participants/post-tenure faculty with new perspectives on navigating the PTR process to their career-development advantage
2. Assist engineering faculty in developing a long-term roadmap that incorporates the PTR process into their short-term and long-term strategic plan
3. Broaden administrators’ national perspective by exploring PTR practices of other institutions. This will provide them with a new understanding and ability to engage in a more informed dialogue at their home institutions during policy revisions.

The conveners have several years of PTR experience, which include coordinating the development of departmental and college policies with the provost’s office, providing guidance to faculty undergoing PTR, managing the submission process for the North Carolina State University College of Engineering, and leading the college-level review of dossiers and associated communications with faculty and upper administration.

The following is an overview of the session:

1. Introduction to Post-tenure Review: We will start with a review of the literature on PTR and pose the question of the potential of PTR to impact the climate, culture, collegiality and changing processes in colleges of engineering.
2. State of Post-tenure Review at Colleges of Engineering: Participants will explore the current state of PTR at their home institutions. Questions include: Do you have PTR now, and how long has it been in place? Is PTR “coming to a campus near you?” Have there been significant changes in the processes and what has the role of the faculty been in the discussion and implementation of changes? What are the elements/processes of a review and the associated timescale?
3. Administrative Perspectives: Current and former engineering deans will provide perspectives on the PTR process and the future impacts on engineering academia.
4. Diagramming a PTR Regulation – A University Comparison: a brief overview of PTR regulations and the execution in the College of Engineering at NC State and highlights of PTR at three other schools. Because a number of the processes are new and still changing, this exercise will help participants initiate a diagram of their unit processes and take a more active, informed role in policy development at their home institutions.
5. Developmental Next Steps: The session convening group will prepare a summary of the findings, share them with participants, and recommend promising practices to the ASEE Faculty Development Division.
# ASEE'S VIRTUAL CONFERENCE

## WEDNESDAY, JUNE 24 Sessions

### W560B - Live Interactive ASEE Fellows Session - for Fellows Only

**2:30 P.M. - 3:30 P.M., ONLINE, A VIRTUAL CONFERENCE**

**Sponsor:** ASEE Headquarters  
**Moderator:** Sarah Rajala, Iowa State University

For new and existing ASEE Fellows!

### W567 - Best Zone Papers

**2:30 P.M. - 3:30 P.M., ONLINE, A VIRTUAL CONFERENCE**

**Sponsor:** Council of Sections  
**Moderator:** Gary Steffen, Purdue University Fort Wayne

Presentation of the outstanding 2019 section Annual Conference papers as selected by each of the four ASEE Zones. One paper will be selected as the 2019 best overall section conference paper winner.

- **Zone I:** The Engineers' Orchestra: A Conductorless Orchestra for Developing 21st-Century Professional Skills
  - Diana Dabby (Olin College)
- **Zone II:** A New Assessment Model in Mechanics of Materials
  - Ron Averill, Sara Roccabianca, and Geoffrey Recktenwald (Michigan State University)
- **Zone III:** Supplemental Instruction and Just-in-Time Tutoring: The Who, When, and Why Students Attend in a First-year Engineering Course
  - David J. Ewing, Catherine Unite, Christina Miller, and Cedric Shelby (University of Texas at Arlington)
- **Zone IV:** BOOSTing Preparedness Through Engineering Project-based Service Learning
  - Deborah Won, Gustavo Menezes, Adel Sharif, Masood Shahverdi, Ni Li, and Arturo Pacheco-Vega (California State University, Los Angeles)
  - Gisele Ragusa (University of Southern California)

### W568A - EDC Public Policy Committee Meeting

**2:30 P.M. - 3:30 P.M., ONLINE, A VIRTUAL CONFERENCE**

**Sponsor:** Engineering Deans Council

Meeting of the Engineering Deans Council (EDC) Public Policy Committee members

### W568B - EDC Executive Board Meeting

**3:30 P.M. - 4:30 P.M., ONLINE, A VIRTUAL CONFERENCE**

**Sponsor:** Engineering Deans Council

This is the meeting and luncheon of the Engineering Deans Council Executive Board.

### W577B - Safe Zone Level 2

**3:30 P.M. - 4:30 P.M., ONLINE, A VIRTUAL CONFERENCE**

**Sponsors:** ASEE Commission on Diversity, Equity & Inclusion; First-Year Programs Division  
**Moderators:** Robyn Paul, University of Calgary; Alisha Sarang-Sieminski, Franklin W. Olin College of Engineering

**Speakers:** Prof. Alon V. McCormick, University of Minnesota - Twin Cities; Mr. Tiago R. Forin, Rowan University

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 workshops are interactive, research-informed workshops that seek to foster a more inclusive environment for LGBTQ+ individuals in STEM through building participant knowledge and skills and creating a visible network of allies. Faculty, students, administrators, staff, and other professionals are encouraged to participate in these workshops.

The Level 2 Safe Zone workshop explores the concepts and implications of privilege and bias, the climate for LGBTQ+ individuals in STEM and ways that allies can support LGBTQ+ students and colleagues, and techniques for creating inclusive classroom environments.

Safe Zone Ally Training workshops are supported by the National Science Foundation (NSF) through grants EEC-1539140 and EEC-1748499. To learn more and access free ally resources, please visit https://lgbtq.asee.org/.
W577C - Equity and Inclusion Advocacy: Diversity, Equity, and Inclusion 100
2:30 P.M. - 3:30 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsors: ASEE Commission on Diversity, Equity & Inclusion; First-Year Programs Division

Moderators: Fantasi Curry, Purdue University at West Lafayette; Meagan Pollock, Engineer Inclusion; Jean Sanders, North Carolina State University at Raleigh; Jenna Carpenter, Campbell University

Speakers: Miss Fantasi Nicole Curry, Purdue University at West Lafayette; Dr. Meagan C. Pollock, Engineer Inclusion

Diversity, equity, and inclusion starts with us. The session aims to answer the questions: What is DEI? Why should I care about it? What work do I need to do to become a more equitable educator? In this workshop, participants will identify ways in which we can expand our awareness through self-analysis. Participants will engage in learning activities that provide an introductory overview of DEI, including reflection on their identities, privileges, biases, spheres of influence, and beliefs related to diversity, equity, and inclusion.

W640 - Hispanic Women in Engineering: Initiating Dialogue for Change
4:30 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Minorities in Engineering Division

The inspiration for this workshop comes from the challenges and experiences shared by Hispanic women studying engineering, professional engineers in training, engineers in the workplace and in professions, and members of professional societies. This workshop offers a safe space for initiating the much-needed dialogue toward a more inclusive paradigm for minorities in engineering.

The workshop organizers are from a broad and diverse group of Hispanic women in engineering who can discuss undergraduate and graduate student experiences, professional organization perspectives, employee/employer experiences, and engineering education.

W699A - VIRTUAL WORKSHOP: Mixed Reality in Engineering Education: How Does it Affect User Experience, Motivation, and Student Performance?
4:30 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Sponsored Sessions

Speakers: Dr. Kyle Johnsen, University of Georgia; Dr. Dominik May, University of Georgia; Valerie Varney, IMA/SLW of RWTH Aachen University

Mixed reality, used as the overarching expression for both augmented and virtual-reality technologies, has become a common term within the past few years. Not only does the gaming world use it to make users feel more immersed in computer games, but also many industrial enterprises have discovered that they can use Mixed Reality for training and further education of their staff. According to the Gartner Hype Cycle for Emerging Technologies of 2019, Mixed Reality is no longer seen as an emerging technology but has risen to the stage of productivity.

Universities also have discovered Mixed Reality as an interesting new technology to foster teaching and learning processes. However, university lecturers often struggle to include such new technologies into their lectures, even if it might be easier than expected. Often it is too little knowledge about the advantages and suitable fields of application, or the technological implementation, that deter them. This workshop is meant to show examples of Mixed Reality applications in the engineering education field. It will allow for both individual practical experiences with such technologies and broader discussions about future trajectories for further development, chances, and barriers for Mixed Reality as an integral part of modern engineering education.

The workshop consists of three consecutive phases:

1. In the introductory phase, the presenters start off with a general overview of Mixed Reality technology for educational purposes and give insights into several learning environments making use of Mixed Reality

2. In the second phase, participants have the opportunity to try out several settings and afterwards evaluate their personal experience

3. Lastly, participants will be given an insight into existing assessment, evaluation, and educational research efforts for virtual learning environments. Furthermore, they will discuss their own experience in order to identify use cases for their own teaching and learning purposes
W699B - VIRTUAL WORKSHOP: Art to STEM: Using Comics to Improve Student Learning in Engineering

4:30 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Sponsored Sessions
Speakers: Dr. Lucas James Landherr, Northeastern University; Dr. Jennifer Pascal, University of Connecticut

This will be a hands-on, engaging workshop that introduces the decades-long history of comics in education, the success of comics in STEM education, and how two engineering faculty members have used comics in their courses. During this workshop, participants will work on developing a comic for a topic in one of their courses and be presented a working model for both the production and use of educational comics. Upon the conclusion of this workshop, participants will be able to: (1) Describe the historical context of comics in education; (2) Explain the process for making comics; (3) Facilitate student development of comics in their courses; (4) Develop their own comics for use in their courses.

W699C - VIRTUAL WORKSHOP: Teaching K-12 STEM with Robotics: Engaging Students with STEM Content in an Authentic Manner

4:30 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Sponsored Sessions
Speakers: Dr. Shramana Ghosh, New York University Tandon School of Engineering; Pooneh Sabouri, New York University; Angela Graham, Middle School 88, New York City; Jane Lam, Sunset Park Prep; Sumaiya Ahmed, Middle School 890, New York City

Policymakers, researchers, and administrators are continually engaged in endeavors to create opportunities that can attract and retain students in educational pipelines leading to future STEM careers. Hence, it is critical for all stakeholders to pay close attention to STEM educational innovations and interventions in the middle-school grade levels, as it is well known that students begin to formulate their initial conceptions of future careers during this period. Studies have shown that inability to adequately maintain and support student interest and engagement with STEM content during middle school results in fewer students pursuing STEM-related majors in college.

The objective of the workshop is to present insights, focused on teaching and learning K-12 STEM with robotics, derived from the workshop organizers’ multiyear experience conducting and participating in a teacher professional development program at NYU Tandon School of Engineering. This interactive workshop will be facilitated by two postdoctoral researchers and conducted by three middle school teachers. The workshop will include: 1) an introduction to the three dimensional (3-D) learning model of NGSS and 5E instructional model; 2) an illustration of successful LEGO robotics enhanced NGSS-plus-5E lessons created and implemented by the teachers; 3) discussion of classroom implementation experiences and challenges of integrating robotics; 4) an active breakout session where workshop facilitators will work with the participants to support them in developing their own lesson ideas; and 5) constructive feedback and reflection session for participants.

During the workshop, participants will improve their lesson-planning skills by developing a practical understanding of the 3-D learning model of NGSS and by practicing the use of the 5E instructional model. The example lessons created and implemented by the teachers integrate LEGO robots in an authentic manner for teaching key middle school STEM concepts. Workshop attendees will observe demonstrations of the lesson activities using LEGO robots (provided by the organizing team) in groups to simulate learner experience. This will be followed by a discussion of goals of the lessons, pedagogical methods, instructional strategies, challenges of classroom implementation, and suggested modifications for different classroom conditions among the organizing team, teachers, and attendees. Attendees will then have an opportunity to participate in a group activity where they will be supported by the organizers in brainstorming ways in which they can integrate different robotic-based lessons in their own classrooms. The workshop will conclude with a constructive feedback and reflection session soliciting participant opinions regarding the merits and challenges of the presented approach.

The workshop will emphasize the creation of NGSS-aligned classroom implementable lessons that use robotics to engage students with STEM content. It will demystify the process of creating NGSS-aligned lessons for K-12 educators; address the challenges and benefits of their classroom implementation; and encourage participants to engage students with key science and engineering practices through use of technologies such as robotics. Participants will further receive access to rich content developed by the organizers to support the creation and implementation of NGSS-plus-5E lessons as a part of a multiyear research effort, along with planning and implementation support from the project staff in the following academic year as needed.

The educator-leaders of the workshop gained extensive experience in creating and implementing LEGO robotics-enhanced STEM lessons in their middle school classrooms; creating and implementing NGSS-plus-5E lessons; conducting workshops to share their experiences with peers; and sharing their work through scholarly publications, all through their participation with the research-oriented teacher professional development program at NYU Tandon. While the program at NYU used LEGO robots, workshop participants will not be limited to the use of any specific robotic platform for teaching and learning STEM concepts. Nonetheless, it will be beneficial for participants to have working knowledge of at least one robotic platform used in K-12 STEM education. A quick introduction to commonly used educational robotic platforms will also be provided during the session.
W699D - VIRTUAL WORKSHOP: A Phasor Toolbox for AC Circuit Analysis using MATLAB

4:30 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Sponsored Sessions

Speakers: Dr. Jai P. Agrawal, Purdue University Northwest; Prof. Omer Farook, Purdue University Northwest

DC and AC circuit analysis is the beginning fundamental course in engineering/technology programs. Many textbooks use calculators as the engine for long and complex calculations. Focused on not committing mathematical mistakes, students often do not pay enough attention to the concepts and tools. Furthermore, the conventional method of AC circuit analysis uses phasors and phasor-based methods.

This workshop presents a Phasor Tool Box which contains most functions that would be needed to do phasor calculations and enable students to visualize the phasor diagrams. The tool box is designed in MATLAB and requires students to have minimal scripting background, keeping in mind that these tools will be used by the beginner students in electrical engineering/technology programs. Using this tool is as easy as using algebra for adding, subtraction, multiplication, division of phasors, and additionally to visualize these operations in the complex plane.

Workshop participants will get the soft copy of the Phasor Tool Box and a book, "Phasor Methods of AC Circuit Analysis."


4:30 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Sponsored Sessions

Speakers: Dr. Sheila Anne Gobes-Ryan, University of South Florida; Dr. Joanna G Bartell, University of South Florida; Jamie Chilton, University of South Florida; Dr. Kingsley A. Reeves Jr., University of South Florida

As engineering programs across the country work to address ABET’s communication competency requirement, these programs increasingly are looking for ways to incorporate writing into their curricula. In addition to developing communication competency, writing in engineering courses also offers a significant opportunity for enhancing core student learning outcomes with the effective application of writing-to-learn strategies. Writing-to-learn strategies have been successfully applied and studied across a range of STEM curricula as a way to increase students’ abilities to grasp, discuss, and apply the materials and methods they are learning.

This workshop, led by members of the integrated communication program at the University of South Florida’s College of Engineering, will be an active, discussion-based session focused on writing-to-learn pedagogy, strategies, and application. The facilitators will first offer an overview of writing-to-learn literature and best practices as well as a short discussion about their own efforts to implement writing-to-learn assignments in several engineering courses in the College of Engineering at the University of South Florida. In the second half of the workshop, participants will have the opportunity to develop writing-to-learn strategies and assignments for their own courses as they brainstorm with and work alongside faculty from diverse engineering backgrounds.

W699F - VIRTUAL WORKSHOP: Integrated E-Learning Modules for Developing an Entrepreneurial Mindset in Students

4:30 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Sponsored Sessions

Speakers: Dr. Ronald S. Harichandran P.E., University of New Haven; Dr. Nadiye O. Erdil, University of New Haven; Dr. Maria-Isabel Carnasciali, University of New Haven; Dr. Jean Nocito-Gobel, University of New Haven; Dr. Cheryl Q Li, University of New Haven

The University of New Haven has developed 18 e-learning modules designed to be integrated into engineering and computer science courses in a hybrid format so as to develop an entrepreneurial mindset in students. These modules are publicly available and may be downloaded for implementation within a university’s Learning Management System. This workshop will inform attendees about the 18 modules and their learning objectives, train them on how to deploy the modules within engineering and computer science courses, and get them prepared to deploy one module of their choosing.
### W699G - VIRTUAL WORKSHOP: Doing Empathy in Engineering - An Interactive Workshop

**4:30 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE**

**Sponsor:** Sponsored Sessions  
**Speakers:** Dr. Johannes Strobel, University of Missouri - Columbia; Prof. Maartje E. D. Van den Bogaard, Delft University of Technology; Miss Angela van Barneveld, Lakehead University

Empathy as part of emotional intelligence has recently gained a lot of traction in the engineering education research literature and education through human-centered design and diversity/inclusion initiatives. Empathy in engineering is unique and brings its own tools and techniques. This interactive workshop introduces participants to an engineering-specific empathy model and techniques to employ empathy as a tool of self-reflection and in the work environment.

### W699H - VIRTUAL WORKSHOP: Returning Graduate Students: Mentoring, Advising, and Teaching Graduate Students with Industry Experience

**4:30 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE**

**Sponsor:** Sponsored Sessions  
**Speaker:** Dr. Diane L. Peters P.E., Kettering University

This workshop will provide information about the demographic characteristics, skills, and challenges of graduate students returning from industry. Drawing on research, it will focus on the ways in which faculty can build on these students’ strengths. It will include both presentations of information and structured discussions of participants’ own institutions and their graduate programs, with the goal of helping participants see ways in which they could better support returning students’ success and draw on the students’ unique backgrounds to enhance graduate community culture.

### W699I - VIRTUAL WORKSHOP: Recent Developments of Remote Laboratories

**4:30 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE**

**Sponsor:** Sponsored Sessions  
**Speaker:** Prof. Michael E. Auer, IAOE

Advancement in computer and Internet technologies allowed tremendous growth of networks and hence the Internet of Things. Engineering educators and researchers utilized this protocol to connect their experimental systems with the web. That, in turn, led to Internet-accessible remote laboratories. Given their specialized development, there is no formal or informal training either in the design and development of remote laboratories or their use in laboratory 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. Participants will become familiar with a few developed remote laboratory technologies in STEM disciplines, be shown how to use them, and learn about the associated pedagogy. At the end there will be a discussion session where attendees can learn from experienced experts about incorporating remote laboratories in their own laboratory courses.

### W699J - VIRTUAL WORKSHOP: How to Integrate Equity and Inclusion into the Engineering Classroom through Student-authored Children’s Books

**4:30 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE**

**Sponsor:** Sponsored Sessions  
**Speakers:** Dr. Lisa Bosman, Purdue University at West Lafayette; Dr. Meagan C. Pollock, Engineer Inclusion

Children begin to postulate their future careers at about four to five years old. However, there is a dearth of children’s literature that features engineers and other STEM professionals, and significantly less STEM-minded literature with women/girls and people of color in non-stereotype-conforming roles. With increasing industry demand for engineers, it is critical that we create new ways of reaching children, sparking interest, and challenging stereotypes.

Your engineering students have stories, and their stories matter. Diverse stories matter, and providing space for students to express creativity, practice inclusivity, and apply their learning in an integrative curricular activity can boost engagement and participation. The literature has shown evidence that engineering identity is an important factor in student success. Thus, a scaffolded project that assists them in writing engineering-focused children’s books can help. This type of project, with publication and scaling in mind, also cultivates entrepreneurial thinking.

This workshop will (1) provide participants with a fool-proof, step-by-step process for guiding engineering students through the children’s book-writing process; (2) explain how Kindle Direct Publishing (a free self-publishing service owned by Amazon.com) can be used to sustain the project and build revenue to support other initiatives; (3) provide an overview of how to convert the active-learning project into engineering education research for publication and dissemination; and (4) make a case for how and why this approach can and should be integrated into freshman-level introduction to engineering courses to broaden participation and increase equity and inclusion.
W699K - VIRTUAL WORKSHOP: Introducing STEM Concepts at Freshman Level via a New Design-driven Robotics Class
4:30 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Sponsored Sessions
Speaker: Dr. Anurag Purwar, Stony Brook University

In this workshop, we will 1) introduce attendees to the motivation and structure of the class; 2) lead them through a series of hands-on robot and mechanical design exercises using the robot kit and app to design and prototype simple mechanical contraptions, as well as more complex machines and robots; and 3) demonstrate how to incorporate significant design activities in the classroom while teaching concepts from mechanical engineering, electronics, and computer programming.

The robot kit works with off-the-shelf electronics and open-source software such as Arduino, and employs an open architecture to allow users to design and make their own parts. The software served through a web browser is the first app of its kind, which helps students design planar linkages for robot motions. The app implements algorithms developed through an NSF-funded award to the presenter.

The first 20 registered attendees will be provided with a free robot kit.

W699M - VIRTUAL WORKSHOP: Applying for an NSF CAREER Award? Research-based Workshop to Support Early Career Faculty
4:30 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Sponsored Sessions
 Speakers: Dr. Jennifer Karlin, Minnesota State University, Mankato; Dr. Allison Godwin, Purdue University at West Lafayette

This workshop will be structured into two parts. The first part will focus on an interactive session presenting and reflecting in small groups on research-based practices from a collaborative inquiry retreat held with current and former engineering education CAREER awardees and from surveys sent to early career faculty in engineering education across the U.S. in March 2019. The topics will center around three areas: What makes a good CAREER proposal; tips and advice that prior awardees wished they had received when writing CAREER proposals; and resources for applicants. The learning goal for this part of the workshop is for early-career faculty to understand what is required for an NSF CAREER proposal and what elements are important for successful projects. The knowledge conveyed in this part of the session moves beyond what is contained in the Request for Proposals or Proposal and Award Policies and Procedures Guide on the NSF website. Broad sharing of this information will begin to create more equitable and widespread support for this award in engineering education.

The second part of the workshop will be an open work time and mentoring session for early career faculty to develop a one-page summary of their project idea to facilitate a discussion with the EEC Program Officer, Ed Berger, who will be present at the workshop for feedback. As a part of the project, a group of Lead Mentors have been identified. These Lead Mentors have been awarded NSF CAREER grants and are associate or full professors in engineering education fields. The Lead Mentors will facilitate mentoring circles to answer questions and provide individual feedback during the second half of the workshop. The learning goal for this portion of the session is to create a network of early career and more senior faculty in engineering education and to provide opportunities for targeted and specific feedback on ideas.
W699N - VIRTUAL WORKSHOP: Curriculum and Course Design for Mechatronics and Robotics Engineering Education
4:30 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Sponsored Sessions
Speakers: Dr. Nima Lotfi, Southern Illinois University Edwardsville; Prof. Michael A. Gennert, Worcester Polytechnic Institute; Dr. Vikram Kapila, New York University Tandon School of Engineering; Dr. Carlotta A Berry, Rose-Hulman Institute of Technology; Dr. Kevin Stanley McFall, Kennesaw State University; Prof. Musa Jouaneh, The University of Rhode Island

This workshop is motivated by the rapid growth in mechatronics and robotics engineering (MRE) and therefore the need for students with a strong multidisciplinary theoretical and experimental skill set. These students are the future engineers who will design, develop, and implement transformative autonomous technologies that improve human health and welfare.

Recognizing the need for preparing highly educated MRE professionals, many universities and colleges are adopting MRE as a distinct degree program. However, there is not a well-defined and unified framework for such programs, which can cause confusion and ambiguity among instructors and future employers. To overcome this challenge, the authors, with financial support from NSF, have been engaged in holding several workshops on the future of mechatronics and robotics engineering education. These workshops have brought together more than 150 faculty, students, and industry professionals in the MRE field to share broad success stories; to develop concept inventories for MRE curricula and courses; to identify thought leaders; to learn the recent trends in industry; and to develop a roadmap for MRE education.

Capitalizing on the outcomes of these efforts and based on the feedback from prior workshop participants, this workshop aims to:

- Involve a broad range of colleges and universities
- Develop a unified set of courses for MRE curricula
- Prepare faculty to teach mechatronics and robotics courses through hands-on activities
- Further expand the community of MRE educators

W699O - VIRTUAL WORKSHOP: Reverse-engineering YouTube Videos to Develop Course Content
4:30 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Sponsored Sessions
Speaker: Prof. Matthew W. Liberatore, University of Toledo

Today, most students enrolled in higher education were born in the 1980s or 1990s and have grown up with access to computers, the Internet, and many other electronic devices for daily use. Students making up this demographic are designated as digital natives. Numerous studies on the positives and negatives of these technology-savvy students--in education and in the workforce--have been published. This workshop will show how a simple use of technology, specifically videos from YouTube, can engage this generation of students and be a source of new course material.

With textbooks, students have become accustomed to finding solutions manuals on the Internet, which let them focus just on getting the right answer. Our approach, originally called YouTube Fridays, devoted a small fraction of class time to student-selected videos related to the course topic; e.g., thermodynamics. Students then wrote and solved a homework-like problem based on the events in a video. Numerous recent pilots involving hundreds of students have developed a database of videos and questions that reinforce important class concepts such as energy balances and phase behavior. Our National Science Foundation project examined the rigor of YouTube problems and their effect on the problem-solving skills of students. The results prove that using YouTube videos in this way generates problems equal in quality and rigor to those found in textbooks.

W699P - VIRTUAL WORKSHOP: Technology-Enhanced Active Learning - for Busy Skeptics and True Believers
4:30 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Sponsored Sessions
Speakers: Dr. Michael J. Prince, Bucknell University; Dr. Milo Koretsky, Oregon State University; Dr. Brian P. Self, California Polytechnic State University, San Luis Obispo

Active learning has consistently been shown to be more effective than traditional instruction for promoting learning, motivation and student retention. Despite this overwhelming research support, instructors have a number of significant concerns about adopting active learning techniques in their own classes. Common concerns include worries about preparation time, content coverage, and student resistance to new teaching methods.

This hands-on session is designed to introduce quick and simple active learning techniques that are effective, require little preparation or class time, and generate little or no student resistance.

The workshop will introduce an interactive web-based tool that will
enable interactive delivery of workshop content and give participants a direct way to use that content in practice. To facilitate adoption of the active learning pedagogies that are presented, participants will be provided continued access to conceptual questions and other instructional tools for core chemical and mechanical engineering classes, including: Material and Energy Balances, Thermodynamics, Fluid Mechanics, Heat Transfer, Kinetics and Reactor Design, Separations, Materials Science, Statics and Dynamics. The bank of over 2,500 conceptual questions, the easily navigable software interface, and the other available resources will substantially lower the activation barrier for instructors to integrate the pedagogical methods into instruction and assessment.

W699Q - VIRTUAL WORKSHOP: Reframing and Reimagining the Experiences of Doctoral Women of Color in Engineering
4:30 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Speakers: Dr. Sharnnia Artis, University of California, Irvine; Dr. Stacie LeSure, American Society for Engineering Education; Dr. Marjorie C. Shavers, Heidelberg University

Many women of color in doctoral programs in engineering are often the only women of color or one of few women of color in their programs. They often define their experience as isolating and lonely, forcing them to go outside of their programs to find support to navigate their doctoral program. To help women of color thrive during their doctoral experience, this workshop will use research- and evidence-based practices to:

1) Increase the awareness and understanding of the specific issues facing women of color in doctoral programs in engineering
2) Increase cultural competence by participating in a privilege test and discussions aimed at better understanding marginalized communities
3) Identify strategies for creating doctoral environments where all identities, particularly those of women of color, are welcomed in academic engineering spaces
4) Develop an implementation plan to help cultivate a culture of inclusion for doctoral women of color in engineering at your institution.

Special attention will be given to case scenarios and critical incidents on the following themes:

1) Multiple Identities: Women of color have multiple identities that impact their experiences in engineering
2) STEM Identity: Some of their identities are accepted, but others are not accepted in academic and engineering spaces
3) Intersectionality: Recognizing the intersectionality of STEM, gender, and race identities
4) Interventions: Strategies for cultivating an environment where all of our identities are equally accepted, including cultural capital

After the discussion of case scenarios, critical incidents, and project themes, the presenters will facilitate small group discussions around how attendees' work can improve outcomes in the community they are trying to serve, with an emphasis on developing a deeper understanding of the community they serve. The workshop will conclude with attendees developing a strategic plan to address challenges women of color face in doctoral programs in engineering.

4:30 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Speakers: Dr. Jan DeWaters P.E., Clarkson University; Prof. Stefan J. Grimberg P.E., Clarkson University

Background:

The average person in the United States and Canada disposes of approximately 2 kg (4.4 pounds) of solid waste every day. Food and yard waste represent 30% to 40% of the solid waste stream in the U.S. and Canada, respectively, contributing to multiple pressing issues, including gaseous emissions, leachate generation, and diminishing landfill capacity. Many states in the U.S. are in the process of revising waste-disposal regulations to more closely control the disposal of organic wastes. For example, New York State has mandated that as of 2022, facilities producing an annual average of at least two tons of food waste per week will no longer be allowed to landfill their organic wastes. In the greater Montreal area, residents living in buildings of less than nine residences per building are expected by 2025 to divert 60 percent of their organic waste to biological treatment processes (land farming, composting, or anaerobic digestion). Clearly, the time is ripe for educating students about the importance of diverting organic materials from the solid waste stream!

Organics removed from the solid waste stream can be treated aerobically (i.e. compost) or anaerobically, as long as the waste is void of contamination. While both produce valuable fertilizer, anaerobic digesters also recover energy. The biogas produced by anaerobic digestion can be used in a variety of energy systems as a substitute for fossil fuels. Digestate, the liquid effluent from the digester, retains most of the nutrients and can displace commercial fertilizers.

Workshop Details:

This proposed workshop will be both informational and hands-on. Participants will gain knowledge and understanding surrounding the topics of waste disposal, anaerobic digestion, and the relationship between our waste handling practices and our impact on global climate change. We will describe a successful public-school waste food separation program that was created through a partnership between school personnel, Clarkson University faculty and students, and the Cornell Cooperative Extension Service. Then, we will describe a variety of hands-on educational curricula we’ve developed and guide teachers through some of the activities related to solid-waste disposal options (“Where does my trash go?”), what happens when we landfill our trash (“Building a landfill”) and the science behind anaerobic digestion (“Creating Biogas from Food Waste”). Teachers will gain access to educational modules that can be adapted for
their own classrooms. The activities are geared toward middle and high school level but can be adapted for elementary students.

**W699T - VIRTUAL WORKSHOP: Massification of Open-ended, Project-based Design Teaching for Any Class Size**

4:30 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE

**Sponsor:** Sponsored Sessions

**Speakers:** Dr. Robert V. Fleisig P.Eng., McMaster University; Elizabeth Hassan P.Eng., McMaster University

Engineering design is best learned when students have a genuine opportunity to work on design problems to which there is no immediate and obvious solution, and where students can interact with the clients, users, and environments that mimic real-world design context. An effective learning environment is created when students are challenged to deal with ambiguity, work with stakeholders, and ultimately are imposed upon to be creative in the pursuit of a design solution. The goal is to teach students to learn how to think and work like design engineers - not to simply build a device, system, or other outcome. On a small scale, design can be taught in a studio-based environment under the supervision and management of an expert instructor. As the class size grows, a traditional studio-based approach no longer is possible.

In this workshop, participants will experience designing for an open-ended, project-based course for a large class (up to 1,000 students), learn about effective means for massification for open-ended design learning, and discuss effective methods for teaching open-ended design for a large class size.

**W714 - ERM Annual Community Celebration & Awards Reception (Formerly the ERM Brouhaha)**

7:00 P.M. - 9:00 P.M., ONLINE, A VIRTUAL CONFERENCE

**Sponsor:** Educational Research and Methods Division

Enjoy an evening meeting and reconnecting with your fellow ERM division members while celebrating the accomplishments of this year’s Apprentice Faculty Grant Recipients and Best Paper award winners.

**W715 - ECE Division Networking Social**

7:00 P.M. - 9:00 P.M., ONLINE, A VIRTUAL CONFERENCE

**Sponsor:** Electrical and Computer Division

Take this opportunity to network with fellow ECE Division members virtually!

**W716 - Virtual Tour - Energy Facilities**

7:00 P.M. - 9:00 P.M., ONLINE, A VIRTUAL CONFERENCE

**Sponsors:** Energy Conversion and Conservation Division; Ocean and Marine Division; Instrumentation Division

Several educational virtual tours of energy facilities have been planned. Each one is 30 minutes with Q & A.

**W752 - Celebration of Engagement: Community Engagement Division Social**

7:00 P.M. - 9:00 P.M., ONLINE, A VIRTUAL CONFERENCE

**Sponsor:** Community Engagement Division

The ASEE Community Engagement Division welcomes members and guests who are interested in community engagement to join us at this annual event. This will be a fun opportunity to connect with others who are building service into their everyday careers.

**W755 - LEAD Division Social**

7:00 P.M. - 9:00 P.M., ONLINE, A VIRTUAL CONFERENCE

**Sponsor:** Engineering Leadership Development Division

Come join the LEAD Division members for an evening of networking and socializing!

**W763 - Campus Reps Reception & Awards Ceremony**

7:00 P.M. - 9:00 P.M., ONLINE, A VIRTUAL CONFERENCE

**Sponsor:** Campus Representatives

Campus representatives reception and awards ceremony.
W766 - INDUSTRY DAY: CMC and CIPD Virtual Kick-off

7:00 P.M. - 9:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Corporate Member Council

Corporate Member Council (CMC) and College-Industry Partnerships Division (CIPD) members and those interested in becoming members are invited to attend the CMC and CIPD joint virtual social to kick off Industry Day.
ASEE’S VIRTUAL CONFERENCE
THURSDAY, JUNE 25 SESSIONS

R203 - Biological and Agricultural Engineering Division Technical Session 2
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Biological and Agricultural Engineering Division
Moderators: Alicia Modenbach, University of Kentucky; Janie Moore, Texas A&M University

Work in Progress: I Didn’t Know You Did That: A Case Study of Learning Outcomes Across Multiple Engineering Disciplines Compared to Biological and Agricultural Engineering
Miss Cara London, Texas A&M University
Dr. Janie M. Moore, Texas A&M University

Work in Progress: Participants of the Cultivate ACCESS Program
Rachel Ibach, University of Nebraska, Lincoln
Dr. Jennifer Keshwani, University of Nebraska, Lincoln
Dr. Deepak R. Keshwani, University of Nebraska, Lincoln
Sydney E. Everhart, University of Nebraska, Lincoln
Leah Sandall, University of Nebraska, Lincoln

The Effect of Humanitarian Engineering on Female Learning and Confidence
Ms. Tara Gupte Wilson, Ohio State University
Dr. Derek Breid, Saint Vincent College
Dr. Ann D. Christy P.E., Ohio State University
Dr. Clarissa Belloni, Ohio State University

Work in Progress: Design and Implementation of Collaborative Problem-based Learning Laboratory Modules for Engineering and Nonengineering Students
Prof. Youngmi Kim, University of Wisconsin, River Falls

A Curriculum in Urban Agriculture and Sustainability, and Lessons Learned
Dr. Lisa Deane Morano, University of Houston, Downtown
Dr. Vassilios Tzouanas, University of Houston, Downtown

R204 - Introduction to the Field of Biomedical Engineering
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Biomedical Engineering Division
Moderators: Michael Rust, Western New England University; William Guilford, University of Virginia

Preparing Early-career Biomedical Undergraduates through Investigations of Stakeholder Needs: A Qualitative Analysis
Dr. Christian Poblete Rivera, University of Michigan

Dr. Aileen Huang-Saad, University of Michigan
Cassandra Sue Ellen Woodcock, University of Michigan
Annie Wang

A Coding Scheme for Measuring Biomedical Engineering Students’ Breadth of Exposure to the Discipline
Prof. Heidi A. Diefes-Dux, University of Nebraska, Lincoln
Dr. Nicole M. Iverson, University of Nebraska, Lincoln

CardioStart: Development and Implementation of a Tissue Engineering Summer High School Program
Jasmine Naik, University of California, Irvine
Emil Martin Lundqvist, University of California, Irvine
Prof. Christine E. King, University of California, Irvine
Prof. Anna Grosberg, University of California, Irvine

How Does Enrollment Management Affect Student Population Diversity in Biomedical Engineering?
Dr. Rachel C. Childers, University of Oklahoma
Dr. Handan Acar, University of Oklahoma

Introducing Neuroscience to High School Students through Low-cost Brain Computer Interface Technologies
Prof. Christine E. King, University of California, Irvine
Dr. Beth A. Lopour, University of California, Irvine

10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Civil Engineering Division
Moderator: Deborah Besser, University of St. Thomas

This session includes papers highlighting experiential learning opportunities using laboratories and interactive approaches.

Rationale and Design Approach for Full-scale Experiential Learning Opportunities in Structural Engineering
Dr. J. Chris Carroll P.E., Saint Louis University, Parks College of Engineering
Dr. Matthew D. Lovell P.E., Rose-Hulman Institute of Technology
Dr. Kyle Kershaw P.E., Rose-Hulman Institute of Technology
Dr. Shannon M. Sipes, Indiana University
Prof. Ronaldo Luna, Saint Louis University, Parks College of Engineering
Dr. John Aidoo, Rose-Hulman Institute of Technology
Prof. James H. Hanson P.E., Rose-Hulman Institute of Technology

Design and Implementation of Experiential Learning Modules for Structural Analysis
Alec Colin Derks, Saint Louis University
ASEE’S VIRTUAL CONFERENCE
THURSDAY, JUNE 25 SESSIONS

R207 - College Industry Partnerships Division Technical Session 3
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: College Industry Partnerships Division
Moderators: David Schmueser, Clemson University; Charles Baukal, John Zink Co. LLC

Dr. Hang Zhang, Beihang University
Dr. Ming Li, Beijing Foreign Studies University

The Status of University-Industry Collaboration Participating in People-to-People and Cultural Exchanges in Engineering Technology Among the Belt and Road Initiative Participants
Prof. Wei Yao, Zhejiang University
Mr. Shunshun Hu, Zhejiang University
Mr. Zhaowei Chu, Zhejiang University
Mr. Bifeng Zhang, Zhejiang University

R223 - Focus on ETAC Accreditation
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Technology Division
Moderator: Michael Shenoda, State University of New York, College of Technology at Farmingdale

A Control System Design Approach to Improve the Attainability of Student Learning Outcomes in Engineering Technology Courses
Dr. Chandra Bhushan Asthana P.E., Elizabeth City State University
Dr. Kuldeep S. Rawat, Elizabeth City State University
Dr. Akbar M. Eslami, Elizabeth City State University

Engineering Technology Accreditation: Avoid the Pitfalls and Be Prepared
Dr. Barbara L. Christie, State University of New York
Dr. Scott C. Dunning, University of Maine

Landscape of Engineering Technology Programs as Seen from ASEE
Aimee T. Ulstads, Ohio State University
Ms. Kathryn Kelley, Ohio State University

Streamlining Continuous Improvement: Efficiently Creating Value While Satisfying ABET Criterion 4
Dr. Thomas M. Hall Jr., Northwestern State University of Louisiana
Dr. Scott Danielson, Arizona State University
Ms. April Chit Cheung, Purdue University, West Lafayette

R224 - ENT Division Technical Session: Assessment Tools and Practices
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Entrepreneurship & Engineering Innovation Division
Moderators: Sandra Clavijo, Stevens Institute of Technology (School of Engineering and Science); Jason Forsyth, James Madison University

An Approach to Assess Achievement of EML through Integrated e-Learning Modules
Dr. Ronald S. Harichandran, University of New Haven
Aadityasinh Rana
Dr. Nadiye O. Erdil, University of New Haven

Comparison of Entrepreneurial Mindset Course Learning Objectives: Evaluating Consistency and Clarity
Laine E. Rumreich, Ohio State University
Faith Logan, Ohio State University
Zachary Dix, Ohio State University
Mr. Nicholas Rees Sattele, Ohio State University
Dr. Krista M. Kecskemety, Ohio State University
Dr. Ann D. Christy P.E., Ohio State University

Creating a Master “Entrepreneurial Mindset” Concept Map
Dr. Cheryl A. Bodnar, Rowan University
Mr. Siddharthsinh Jadeja, Rowan University
Dr. Elise Barrella P.E., Wake Forest University

Using Entrepreneurial Mindset Constructs to Compare Engineering Students and Entrepreneurs
Dr. William J. Schell IV P.E., Montana State University
Dr. Agnieszka Kwapisz, Montana State University
Kregg Aytes, Montana State University
Dr. Scott E. Bryant, Montana State University
Dr. Brock J. LaMerres, Montana State University
Mrs. Elizabeth B. Varnes, Montana State University

“EMbedding” the KEEN Framework: An Assessment Plan for Measuring ABET Student Outcomes and Entrepreneurial Mindset
Dr. John K. Estell, Ohio Northern University

R225 - Innovative Approaches to Improving Student Learning
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Environmental Engineering Division
Moderators: Alexa Rihana Abdallah, University of Detroit Mercy; Amalia Kokkinaki, University of San Francisco; Veera Gnaneswar Gude, Mississippi State University

Overcoming Affective and Cognitive Chemistry Challenges in an Introductory Environmental Engineering Course Using a Flint Water Crisis Case Study
Prof. Matthew James Scarborough, University of Vermont
Dr. Katherine D. McMahon, University of Wisconsin, Madison

Implementation of Real-world Class Activities in an Introduction to Environmental Engineering Class
Dr. Cara J. Poor, University of Portland
Dr. Heather Dillon, University of Portland
Jeffrey Matthew Welch, University of Portland
Dr. Nicole C. Ralston, University of Portland

Examining the Effectiveness of Short, Voluntary, Online Tutorials in a Large Undergraduate Class
Prof. Alison Cupples, Michigan State University

Course Outcome Assessment: Is Using the Average Good Enough?

Col. Phil Dacunto, United States Military Academy
Capt. Andrew Joseph Ng, United States Military Academy

R226 - Experimentation and Laboratory-oriented Studies Division Technical Session 5
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Experimentation and Laboratory-oriented Studies Division
Moderator: Natasha Smith, University of Virginia

Clay Ceramic Water Filter Performance for Stationary and Solid Body Rotation Conditions
Mr. Jacob Robert Huene, Oral Roberts University
Mr. Michael Stephen Huene, Oral Roberts University
Miss Esther Marie Spear, Oral Roberts University
Mr. Ezra Whitman Walblay, Oral Roberts University
Mr. Harley Craig, Oral Roberts University
Dr. John E Matsson, Oral Roberts University

An Improved Design for a Viscometer Apparatus
Mr. Joseph Michael Derrick, Indiana University - Purdue University Indianapolis
Mr. Michael Golub, Indiana University - Purdue University Indianapolis
Dr. Jing Zhang, Indiana University - Purdue University Indianapolis

Procurement of Undergraduate Transient Heat Transfer Lab Experiment at No Budget
Prof. Nihad Dukhan, University of Detroit Mercy

Operations Laboratory Module on Heat Exchangers
Dr. Courtney Pfluger, Northeastern University
Dr. Dayna Lee Martinez, Northeastern University

R227A - First-year Programs: Focus on Students
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: First-year Programs Division
Moderators: Ashish Borgaonkar, New Jersey Institute of Technology; Emma Tevaarwerk, Northwestern University

An Investigation into How Students Spend their Time During Study Breaks
Mr. Christopher Rennick, University of Waterloo
Dr. Carol Hulls P.Eng., University of Waterloo
Ms. Mary A. Robinson, University of Waterloo

Misunderstandings, Mistakes, and Dishonesty: A Post-hoc
ASEE’S VIRTUAL CONFERENCE
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#ASEEVC

Analysis of a Large-scale Plagiarism Case in a First-year Computer Programming Course
Dr. Philip Reid Brown, Rutgers, the State University of New Jersey
Dr. Ilene J. Rosen, Rutgers, the State University of New Jersey

Work in Progress: Openness, Conscientiousness, Self-direction, and Mindset in First-year Engineering Students
Dr. Matthew Cavalli, Western Michigan University
Ms. Anetra Grice, Western Michigan University

Work in Progress: First-year Engineering Students’ Study Strategies and their Academic Performance
Ahmed Ashraf Butt, Purdue University, West Lafayette
Saira Anwar, Purdue University, West Lafayette
Dr. Muhsin Menekse, Purdue University, West Lafayette

Relationship Between Gen Z Engineering Students’ Personality Types and Topics of Technical Interest
Dr. Goli Nossoni, University of New Haven
Dr. Ronald S. Harichandran, University of New Haven

R227B - First-Year Programs: Assessment in the First Year
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: First-year Programs Division
Moderators: Djedjiga Belfadel, Fairfield University; Jonathan Aurand, Dunwoody Institute

Extended Exam Wrappers: A Comparison of Approaches in a Learning Strategies Course
Ms. Abigail T. Stephan, Clemson University
Dr. Elizabeth Anne Stephon, Clemson University
Matthew K. Miller, Clemson University

Peer Sharing Presentations in a First-year Engineering Learning Strategies Course
Ms. Abigail T. Stephan, Clemson University
Dr. Elizabeth Anne Stephon, Clemson University
Laurel Whisler, Clemson University
Dr. Andrew I. Neptune, Clemson University

Algorithm for Consistent Grading in an Introduction to Engineering Course
Prof. Joshua A. Enszer, University of Delaware
Prof. Jenni M. Buckley, University of Delaware

Implementation of Mock Exam Structure for an Introductory Engineering Course
Miss Nisha Abraham, University of Texas at Austin
Dr. Nina Kamath Telang, University of Texas at Austin

Dr. Jamie R. Gurganus, University of Maryland, Baltimore County
Shannon M. Clancy
Mr. Richard Olaf Blorstad, DeMatha Catholic High School
Mr. Ryan Reinhardt,
Dr. Charles D. Eggleton, University of Maryland, Baltimore County
Prof. L. D. Timmie Topoleski, University of Maryland, Baltimore County

R228 - Online and Professional Graduate Programs
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Graduate Studies Division
Moderators: Kathleen Luchini Colbry, Michigan State University; Jeffrey Fergus, Auburn University

Scalable Synchronous Cohort-based International Education
Dr. Tilman Wolf, University of Massachusetts, Amherst
Dr. C. V. Hollot, University of Massachusetts, Amherst
Russell Tessier, University of Massachusetts, Amherst
Mr. George Bryan Polivka, Shorelight
Prof. Yadi Eslami, University of Massachusetts, Amherst

Integrated Mobile Learning Platform: Content, Delivery, and Experience - Five Years of Experiences from a Professional Graduate Program
Dr. Bharani Nagaratham, Texas A&M University

Lessons Learned: A Comparison of Ph.D.’s in Technology Management Programs
Dr. James Nevin McKirahan Jr., Indiana State University
Dr. A. Mehran Shahhosseini, Indiana State University
Dr. M. Affan Badar, Indiana State University

Global Business Management Education to Industry Professionals: A Decade of Experiences from a Professional Graduate Program
Dr. Bharani Nagaratham, Texas A&M University
Dr. Barry Lawrence, Texas A&M University
Dr. Frederick Barry Lawrence, Texas A&M University

A Doctorate That Works: Nontraditional Populations Served on Both Sides of the Atlantic
Dr. Michael J. Dyrenfurth, Purdue University, West Lafayette
Dr. Mitchell L. Springer, Purdue University, West Lafayette
Dr. Kathryn Newton, Purdue University, West Lafayette
Dr. Carmen Torres-Sánchez, Loughborough University
Dr. Timothy J. Jacobs, Texas A&M University
Charles M. Wolf, Texas A&M University
R229 - Industrial Engineering Division Technical Session 2
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Industrial Engineering Division
Moderator: Raymond Smith, East Carolina University

Multiplayer Physical and Virtual Reality Games for Team-based Manufacturing Simulation
- Dr. Richard Zhao, Pennsylvania State University
- Dr. Faisal Aqlan, Pennsylvania State University
- Dr. Lisa Jo Elliott, Pennsylvania State University
- Ethan James Baxter, Pennsylvania State University

Strategies for Flipped Classroom Video Development: Educating Generation Z Engineering Students
- Dr. Michelle Alvarado, University of Florida
- Dr. Katie LeAnne Basinger, University of Florida
- Mr. Diego Alvarado, University of Florida
- Ms. Behshad Lahijanian, University of Florida

The CLICK Approach and Its Impact on Learning Introductory Probability Concepts in an Industrial Engineering Course
- Christian Enmanuel Lopez, Lafayette College
- Dr. Omar Ashour, Pennsylvania State University
- Mr. James Devin Cunningham,
- Dr. Conrad Tucker, Carnegie Mellon University
- Dr. Paul C. Lynch, Pennsylvania State University

R230 - Computing and Information Technology Division Technical Session 5
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Computing and Information Technology Division
Moderators: Afsaneh Minaie, Utah Valley University; Reza Sanati-Mehrizy, Utah Valley University

This session presents papers on a variety of topics pertaining to computing and information technology.

Maintaining Dual ABET Accreditation in a Computer Science and Engineering Technology Program
- Dr. Jared Oluoch, University of Toledo

Make Your Data Work: Infusing CMMI Culture in Data Analysis for ABET Accreditation
- Dr. Bin Cong, California State University at Fullerton
- Dr. Christopher Ryu, California State University at Fullerton
- Dr. Raman Menon Unnikrishnan, California State University at Fullerton

Internet of Things Forensics in Smart Homes: Design, Implementation, and Analysis of Smart Home Laboratory
- Shinelle Hutchinson, Purdue University, West Lafayette
- Yung Han Yoon, Purdue University, West Lafayette
- Ms. Neesha Shantaram
- Dr. Umit Karabiyik, Purdue University, West Lafayette

Renewable Energy Engineering Technology (REET) Program
- Dr. Alireza Kavianpour, DeVry University, Pomona

A Healthcare Case-study to Teach Simulation Techniques
- Dr. Hassan Rajaei, Bowling Green State University

R233A - Pre-college Engineering Education Division Technical Session 7
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Pre-College Engineering Education Division
Moderator: Kimberly Farnsworth, Arizona State University

Adding Local Cultural Relevance to Engineering Exploration Lessons for Middle School Students
- Dr. Jacob R. Grohs, Virginia Polytechnic Institute and State University
- Dr. Holly M. Matusovich, Virginia Polytechnic Institute and State University
- Dr. Cheryl Carrico P.E., Cheryl Carrico Consulting, LLC
- Ms. Karen J. Gilbert, Virginia Polytechnic Institute and State University

Talking About Design: Teacher Talk About Design Ideas with Teams of Middle Schools During Engineering Design Projects
- Amanda Johnston, Purdue University, West Lafayette
- Prof. Tamara J. Moore, Purdue University, West Lafayette
- Siddika Selcen Guzey, Purdue University, West Lafayette

The Effectiveness of Using Robotics for Career Technology Education in a Middle School STE(A)M Course
- Dr. Jennifer Parham-Mocello, Oregon State University
- Mr. Ernie Bode, Oregon State University

Understanding Design, Tolerating Ambiguity, and Developing Middle School Design-based Lessons
- Prof. Reagan Curtis, West Virginia University
- Prof. Darran Cairns, University of Missouri - Kansas City
- Johnna Bolyard, West Virginia University
- Mr. David Luke Loomis

Changes in Teacher Self-efficacy Through Engagement in an Engineering Professional Development Partnership
- Malle R. Schilling, Virginia Polytechnic Institute and State University

Schedule subject to change. Please go to www.asee20.pathable.co for up-to-date information

#ASEEVC
Mrs. Tawni Paradise, Virginia Polytechnic Institute and State University
Dr. Jacob R. Grohs, Virginia Polytechnic Institute and State University
Dr. Holly M Matusovich, Virginia Polytechnic Institute and State University
Dr. Cheryl Carrico P.E., Cheryl Carrico Consulting, LLC
Ms. Holly Larson Lesko
Dr. Gary R. Kirk, Dickinson College

R233B - Pre-college Engineering Education Division Technical Session 8
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Pre-College Engineering Education Division
Moderator: Anthony Butterfield, University of Utah

WIP: All-inclusive Outreach: A Long-term Cooperation Process Between a Finnish Mid-sized University and a Mid-sized Town
Dr. Johanna Kristiina Naukkarinen, Lappeenranta-Lahti University of Technology
Ms. Kati Maarit Koikkalainen, Lappeenranta-Lahti University of Technology

WIP: Building the Bioengineering Experience for Science Teachers (BEST) Program
Dr. Miiri Kotche, University of Illinois at Chicago
Dr. Jennifer D. Olson, University of Illinois at Chicago
Mr. Darrin Collins, University of Illinois at Chicago

WIP: Career Pathways
Mrs. Kayla R. Maxey, Purdue University, West Lafayette
Dr. Morgan M. Hynes, Purdue University, West Lafayette

WIP: Development and Implementation of a Bioengineering Module for NSBE SEEK
Dr. Anthony E. Felder, University of Illinois at Chicago
Dr. Miiri Kotche, University of Illinois at Chicago
Miss Amna Hoda, University of Illinois at Chicago

WIP: Development of a Mobile Application That Supports Less-obtrusive Peer Assessment in K-12 Engineering Education Using an Engineering Epistemic Frame
Dr. Tamecia R. Jones, North Carolina State University

R234 - Promoting Technical Communication Skills
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Liberal Education/Engineering & Society Division
Moderator: Robin Fowler, University of Michigan

A Partnership Model for Integrating Technical Communication Habits Throughout Undergraduate Engineering Courses
Dr. Kristine Horvat, University of New Haven
Prof. Judy Randi, University of New Haven

The Impact of Scaffolded Writing Instruction on Followup Course Assignments
Dr. Sarah Summers, Rose-Hulman Institute of Technology
Dr. Rebecca Bercich, Rose-Hulman Institute of Technology
Dr. Phillip Cornwell, Rose-Hulman Institute of Technology
Dr. Daniel Takashi Kawano, Rose-Hulman Institute of Technology
Dr. James E. Mayhew, Rose-Hulman Institute of Technology
Dr. Sean Moseley, Rose-Hulman Institute of Technology

The Way Things Work: Sketching and Building to Improve Visual Communication and Spatial Reasoning Skills
Dr. Vicki V. May P.E., Dartmouth College
David Alexander Macaulay

WIP: Online Tutorials to Help Undergraduates Bridge the Gap Between General Writing and Engineering Writing
Mr. Michael Alley, Pennsylvania State University
Dr. Joanna K. Garner, Old Dominion University
Ms. Kaitlyn Pigeon, Pennsylvania State University

R235 - Manufacturing Education Curriculum
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Manufacturing Division
Moderator: Yalcin Ertekin, Drexel University

A Strategy for Integrating Professional Skills Development into a Manufacturing Engineering Curriculum
Dr. Derek M. Yip-Hoi, Western Washington University
Dr. David Gill P.E., Western Washington University

Concurrent Education: A New Postsecondary Educational Model that Provides “Learning for Earning” as well as “Learning for Learning” in Rapidly Evolving Industries such as High Tech Electronic Product Design and Assembly
Tom Borkes, Jefferson Institute
ASEE'S VIRTUAL CONFERENCE
THURSDAY, JUNE 25 SESSIONS #ASEEVC

Manufacturing Impact: Training the Trainers
Dr. Wayne P. Hung, Texas A&M University
Dr. Mathew Kuttolamadom, Texas A&M University
Prof. Bruce L. Tai, Texas A&M University
Ms. Shelly Tornquist, Texas A&M University

R236 - Materials Division
Technical Session 2
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Materials Division
Moderators: Matthew Cavalli, Western Michigan University; Lessa Grunenfelder, University of Southern California

Goal-setting as a Means of Improved Mental Health Outcomes for Materials and Mechanical Engineering Students
Dr. Nicole Johnson-Glauch, California Polytechnic State University
Dr. Lauren Anne Cooper, California Polytechnic State University, San Luis Obispo
Dr. Trevor Scott Harding, California Polytechnic State University, San Luis Obispo

Using Creative Writing as a Tool for Learning Professional Development in Materials Science and Engineering
Dr. Sabrina Starr Jedlicka, Lehigh University

Teaching Report Writing in Undergraduate Labs
Dr. Amber Genau, University of Alabama at Birmingham

Enhancement of Students’ Technical Writing through a Combination of Classroom Activities
Dr. Reihaneh Jamshidi, University of Hartford
Dr. Kamau Wright, University of Hartford
Dr. Paul E. Slaboch, University of Hartford

R238 - Mechanical Engineering
Technical Session: Pedagogy II - Best Teaching Practices
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Mechanical Engineering Division
Moderator: Thomas DeNucci, United States Coast Guard Academy

This session contains papers on best teaching practices within mechanical engineering. The impacts of the flipped classroom, ePortfolios, and note-taking will be presented.

Effects of Note Formatting on Student Learning: Implications for Accessibility and Diverse Minds
Elizabeth Rose Pollack, Michigan State University
Dr. Geoffrey Recktenwald, Michigan State University

Dr. Michele J. Grimm, Michigan State University

Exploring Impacts of a Flipped-instruction Mode for a Disciplinary Computer Applications Course
Dr. J. Blake Hylton, Ohio Northern University
Dr. Lawrence Funke, Ohio Northern University

Transforming an Engineering Design Course into an Engaging Learning Experience Using ePortfolios
Miss Taylor Tucker, University of Illinois at Urbana-Champaign
Ms. Esme Vernooij, University of Illinois at Urbana-Champaign
Catherine LaBore, University of Illinois at Urbana-Champaign
Dr. Ava R. Wolf, Center for Innovation in Teaching and Learning
Cheelan Bo-Linn, Center for Innovation in Teaching & Learning, University of Illinois
Dr. Robert Thomas Baird
Mr. Nattasit Dancholvichit, University of Illinois at Urbana-Champaign
Prof. Leon Liebenberg, University of Illinois at Urbana-Champaign

R239 - Improving Student Outcomes in Mechanics
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Mechanics Division
Moderators: Sarah Wodin-Schwartz, Worcester Polytechnic Institute; Ron Averill, Michigan State University

The Influence of Active, Passive, and Mixed Classroom Activities on Student Motivation
Dr. Jennifer E. Holte, University of St. Thomas
Ryan J. Endres, University of St. Thomas
Dr. Deborah Besser P.E., University of St. Thomas
Dr. Doug Dunston, University of St. Thomas

Effect of Mastery-graded Exams on Student Outcomes in Statics and Mechanics of Solids Course
Dr. Hadas Ritz, Cornell University
Dr. Kathryn Dimiduk, Cornell University
Dr. Andrew van Paridon

Using Assessments to Improve Student Outcomes in Engineering Dynamics
Dr. Ahmad Ghasemloonia P.Eng., University of Calgary
Dr. Meera N.K. Singh, University of Calgary

WIP: Common Errors in Learning Strength of Materials Concepts as a Foundation to an Interactive Web-based Problem-solving Assessment Interface
Dr. Nicole P. Pitterson, Virginia Polytechnic Institute and State
R240 - Minorities in Engineering Division Technical Session 4
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Minorities in Engineering Division
Moderators: Saundra Johnson Austin, Charis Consulting Group, LLC; Christopher Carr, George Mason University

What's in a Story? Comparative Analysis of Role Model and Mentor Narratives
- Dr. Kyle F. Trenshaw, University of Rochester
- Dr. Elif Miskioğlu, Bucknell University
- Derek Rushton, University of Rochester
- Dr. Philip Asare, Bucknell University

Update on Academics with Diversity Education and Mentorship in Engineering (ACADEME) Activities and Fellows
- Dr. Teresa J. Cutright, University of Akron
- Rebecca Kuntz Willits, University of Akron
- Dr. Linda T. Coats
- Prof. Debora F. Rodrigues, University of Houston
- Dr. Lakiesha N. Williams, University of Florida

The Role of Connectedness for Minoritized Students at a Mentoring Conference
- Ms. Carin Queener, University of Michigan
- Dr. Joi-Lynn Mondisa, University of Michigan
- Dr. Dorian Davis
- Dr. Renaldo C. Blocker, The "Why You?" Initiative, Inc.

R245 - Engineering Physics and Physics Division Technical Session 2
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Physics and Physics Division
Moderators: Paul Crilly, United States Coast Guard Academy; Robert Ross, University of Detroit Mercy

A Preliminary Study to Define Limits of Active Learning Strategy Effectiveness in Physics Courses
- Prof. C. Bauer-Reich, University of Jamestown
- Dr. Katrina Christiansen, University of Jamestown

Applications of Quantum Entanglement in Modern Physics
- Dr. Robert A. Ross, University of Detroit Mercy

Computational Modeling in Introductory Physics Courses and Across the Curriculum
- Dr. Todd Zimmerman, University of Wisconsin

R255 - Designing and Implementing Leadership Development Experiences for Engineering Students
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Leadership Development Division
Moderator: David Nino, Massachusetts Institute of Technology

Integrating Professional Skills and Leadership into an Undergraduate Engineering Program
- Dr. Harold Ackler, Boise State University
- Dr. Heidi Reeder, Boise State University
- Mrs. Abbey Louie

Military Leadership for Engineers: A Comprehensive Look at Leadership from Army Doctrine to Engineering Coursework
- Lt. Col. Russell P. Lemler, U.S. Military Academy

Using a Structured Approach to Reflective Journaling in Engineering Leadership Development
- Dr. John Donald, University of Guelph
- Dr. Paul C. Hungler, Queen's University
- Kaitlyn Brant, Queen's University
- Ms. Stephanie Diane Shaw, University of Guelph

Identifying Effective Student Leaders to Improve Capstone Design Team Assignments
- Dr. Blake Everett Johnson, University of Illinois at
ASEE’S VIRTUAL CONFERENCE
THURSDAY, JUNE 25 SESSIONS
#ASEEVC

Urbana-Champaign
Dr. Molly H. Goldstein, University of Illinois at Urbana-Champaign
Dr. Joe Bradley, University of Illinois at Urbana-Champaign

R257 - Faculty Development Evidence-based Practices!
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Faculty Development Division
Moderator: Justin Shaffer, Colorado School of Mines
This session highlights evidence-based practices in faculty development. Come share practices and learn from each other!
A Model for a Faculty Development Course Redesign
Summer Working Group
Dr. Michelle M Blum, Syracuse University
Dr. Katie D. Cadwell, Syracuse University
Dr. Julie M. Hasenwinkel, Syracuse University
Building Communities of Engineering Faculty, Staff, and Students Engaged in Educational Research: The approach of UGA’s Engineering Education Transformations Institute
Dr. John Ray Morelock, University of Georgia
Dr. Nicola W. Sochacka, University of Georgia
Dr. Joachim Walther, University of Georgia
Designing a Streamlined Workshop for STEM-H Faculty Engaged in the Scholarship of Teaching and Learning
Ms. Jody Zhong, University of Louisville
Dr. Patricia A Ralston, University of Louisville
Ms. Teresa Lee Tinnell, University of Louisville
Dr. Thomas Tretter
Dr. Marie Brown

Year-Long Faculty Development Program for New Engineering Instructors: Description and Evaluation
Chris Migotsky, University of Illinois

R271 - NSF Grantees: Workforce Development
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: NSF Grantees Session
Moderators: Amber Genau, University of Alabama at Birmingham; Bimal Nepal, Texas A&M University
Presentations from groups with current NSF "Advanced Technological Education" (ATE) grants.
Critical Findings in the Development of the Community-engaged Educational Ecosystem
Dr. Danielle Wood, University of Notre Dame

Mrs. Alisa Zornig Gura, University of Notre Dame
Dr. Jay B. Brockman, University of Notre Dame
A Technology Pathway Program in Data Technology and Applications
Dr. Valerie A. Carr, San Jose State University
Morris E. Jones Jr., San Jose State University
Dr. Belle Wei, San Jose State University
Developing a Diverse Workforce for the Oklahoma Aerospace Industry - Collaboration Between a Two-year and a Four-year Institution
Prof. Zahed Siddique, University of Oklahoma
Dr. Andrea L’Afflitto, Virginia Tech
Dr. Wei Sun, University of Oklahoma
Dr. Jiyoon Lee, Rose State College
Prof. Steven L. Fowler, Rose State College
Dr. Wayne Jones, Rose State College
Assessing School-to-Career Pathways for Manufacturing in Rural Communities: Further Investigation of Advanced Manufacturing Programs in Northwest Florida
Dr. Marcia A. Mardis, Florida State University
Dr. Faye R. Jones, Florida State University
Solutions for Hiring Manufacturing Technology Instructors
Prof. Karen Woszycyna-Birch, CT College of Technology
Wendy Robicheau

R271B - NSF Grantees: Workforce Development (ATE)
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: NSF Grantees Session
Moderator: Karen Woszycyna-Birch, CT College of Technology
Educating the Workforce in Cyber and Smart Manufacturing for Industry 4.0
Dr. Mathew Kuttolamadom, Texas A&M University
Dr. Jyhwen Wang, Texas A&M University
DeDe Griffith, Northwest Louisiana Technical Community College
Cheri Greer, Northwest Louisiana Technical Community College
An Advanced Technological Education Project for High Value Manufacturing: Lessons Learned
Dr. Michael Johnson, Texas A&M University
Dr. Bimal P. Nepal, Texas A&M University
A Successful Mentoring Approach for Encouraging New NSF
Proposal Submissions from Community Colleges
   Dr. Kathleen Alfano, College of the Canyons

The Future of Work: What is the Impact on Engineering Technicians?
   Dr. Marilyn Barger, Florida Advanced Technological Education Center
   Dr. Richard Gilbert, University of South Florida

R306 - Making Professionals: Methods to Build Success Skills
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Civil Engineering Division
Moderator: Jieun Hur, The Ohio State University

This session includes papers covering strategies to help students build professional success skills.

Listening to Community Voices as Part of Ethical Civil Engineering: Experiences in Civil Engineering Courses
   Dr. Angela R. Bielefeldt, University of Colorado, Boulder

Deliberate Development of Creative Engineers
   Lt. Col. Jakob C. Bruhl, United States Military Academy
   Dr. James Leslie Klosky P.E., United States Military Academy

Integrating World Structures Reports, Presentations, and Themed Notes
   Dr. Anthony Battistini, Angelo State University

Bill and Ted's Excellent Adventure: Lessons Learned from Eight Years' Instruction on the CEBOK
   William D. Lawson P.E., Ph.D., Texas Tech University
   Theodore G. Cleveland, Texas Tech University
   Dr. Ken Rainwater, Texas Tech University

R308A - Computers in Education Division Technical Session 10: STEM Outreach
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Computers in Education Division
Moderators: Raghu Echempati, Kettering University; Joseph Lyon, Purdue University at West Lafayette

This session will highlight COED submitted papers that are related to STEM outreach.

Cybersecurity, Digital Forensics, and Mobile Computing: Building the Pipeline of Next-generation University Graduates through Focused High School Summer Camps
   Dr. Mahmoud K. Quweider, University of Texas Rio Grande Valley
   Dr. Fitratullah Khan, University of Texas Rio Grande Valley

Dr. Liyu Zhang, University of Texas Rio Grande Valley
Dr. Hansheng Lei, University of Texas Rio Grande Valley
Dr. Ala Qubbaj, University of Texas, Rio Grande Valley
Lei Xu, University of Texas, Rio Grande Valley
Dr. Emmett Tomai, University of Texas, Rio Grande Valley
Miss Yessica Rodriguez, University of Texas, Rio Grande Valley
Miss Yessenia Rodriguez, University of Texas, Rio Grande Valley

Minecraft Learning System for Spatial Reasoning in Middle Grades Learners
   Dr. Bryce E. Hughes, Montana State University
   Dr. Nick Lux, Montana State University
   Barrett Frank, Montana State University
   Dr. Shannon D. Willoughby, Montana State University
   Dr. Brock J. LaMeres P.E., Montana State University
   Rachelle Codie Weyerbacher, Montana State University

A Replicate Study: Adoption of a STEM Outreach Program in Kuwait
   Mrs. Safia Malallah, Kansas State University
   Mr. Salah Alfailakawi, Kansas State University
   Joshua Levi Weese, Kansas State University

Competition Of VEX Educational Robotics to Advance Girls' Education (COVERAGE)
   Dr. Afrin Naz, West Virginia University Institute of Technology
   Dr. Mingyu Lu, West Virginia University Institute of Technology
   Chase Broyles, West Virginia University Institute of Technology
   Ms. Isabel Barrio Sanchez, West Virginia University Institute of Technology

STEM Ambassadress Program
   Dr. Afrin Naz, West Virginia University Institute of Technology
   Dr. Mingyu Lu, West Virginia University Institute of Technology
   Mrs. Tommi Brooke Kenneda, West Virginia University Institute of Technology
R308B - Computers in Education Division Technical Session 7: Advanced CS courses
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Computers in Education Division
Moderators: Stephen Edwards, Virginia Polytechnic Institute and State University; Mahmoud Quweider, University of Texas Rio Grande Valley

This session will highlight COED submitted papers that are related to advanced-level Computer Science courses.

Code Hardening: Development of a Reverse Software Engineering Project
Mr. Zachary Michael Steudel, Baylor University
Ms. Cynthia C. Fry, Baylor University

No-Cost Implementation of Network Security Labs Utilizing AWS Educate in an Undergraduate Fundamental Network Security Course
Dr. Karla Page Varnell, East Carolina University

Novel Simulation-Based Learning Modules for Teaching Database Concepts
Dr. Sabahattin Gokhan Ozden, Penn State Abington
Dr. Omar M. Ashour, Penn State Erie, the Behrend College
Dr. Ashkan Negahban, Pennsylvania State University, School of Graduate Professional Studies

Reverse Software Engineering: A Sophomore-level Project in Computer Systems
Ms. Cynthia C. Fry, Baylor University
Kevin Kulda, Baylor University
Gennie Mansi, Baylor University

R308C - Computers in Education Division Technical Session 11
11:40 A.M. - 12:00 P.M.
Sponsor: Computers in Education Division
Moderators: Alisa Gilmore, University of Nebraska - Lincoln; Alex Edgcomb

Constructing and Refining Computer Science Outreach Focused on Student Engagement
Shaya Wolf, University of Wyoming
Mr. Rafer Cooley, University of Wyoming
Mr. Mason Johnson, University of Wyoming
Dr. Andrea Carneal Burrows, University of Wyoming
Dr. Mike Borowczak, University of Wyoming

Work in Progress: Pedagogical Effectiveness of Continuous vs. Discrete User Interaction with Computer Demonstrations

Prof. James C. Squire P.E., Virginia Military Institute
Prof. Gerald Sullivan P.E., Virginia Military Institute
Dr. Tom McCormick, Virginia Military Institute

Work in Progress: An Online Journal Tool with Feedback for a Learning Assistant Program in Engineering
Dr. Milo Koretsky, Oregon State University

R309A - Construction Engineering Division Technical Session 4
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Construction Engineering Division
Moderators: Kelli Kapocis-Herstein, University of Nebraska - Lincoln; Sanjeev Adhikari, Kennesaw State University; Rachel Mosier, Oklahoma State University; Norman Philipp, Pittsburg State University

Where Do All the Pre-Majors Go? A Self-Study of Student Stumbling Points in the Pre-Construction Curriculum
Dr. Kimberly Grau Talley P.E., Texas State University
Dr. Bobbi J. Spencer, Texas State University

Evaluation of Disaster Resilience Preparation in the Construction Education Curriculum
Dr. Sanjeev Adhikari, Kennesaw State University
Dr. Rachel D. Mosier, Oklahoma State University
Dr. Sandeep Langar, University of Texas, San Antonio

Perceptions of Structures Coursework for Career Fulfillment from the Student and Practitioner Perspective
Dr. Rachel Mosier P.E., Oklahoma State University
Prof. Carisa H. Ramming, Oklahoma State University
Dr. Sanjeev Adhikari, Kennesaw State University

Faculty Experience in Team Teaching in Construction Management Higher Education
Dr. Luciana Debs, Purdue University Programs
Dr. Bryan John Hubbard P.E., Purdue University, West Lafayette

The Implementation of BIM Application in University Teaching: Case Study of a Construction Management Program
Dr. Sanjeev Adhikari, Kennesaw State University
Dr. Pavan Meadati, Kennesaw State University
Dr. Minsoo Baek, Kennesaw State University
R309B - Construction Engineering Division Technical Session 5
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Construction Engineering Division
Moderators: Saeed Rokooei, Mississippi State University; Norman Philipp, Pittsburg State University; Luciana de Cresce El Debs, Purdue University Programs; Rachel Mosier, Oklahoma State University

A Construction Management Competition as the Basis of a Capstone Culminating Event
Lt. Col. M. Scott Stanford P.E., United States Air Force Academy
Dr. Joel Sloan P.E., United States Air Force Academy
Dr. James B. Pocock, United States Air Force Academy
Lt. Col. M. Mark Russell P.E., DFCE

Learning in Engineering Project Management Classes: Does Technology Matter?
Dr. Long Duy Nguyen P.E., Florida Gulf Coast University
Dr. Robert O’Neill P.E., Florida Gulf Coast University
Dr. Simeon J. Komisar, Florida Gulf Coast University

An Educational Module to Increase Engineering Students’ Knowledge of Work Zone Safety in Highway Construction
Dr. Didier M. Valdes, University of Puerto Rico, Mayaguez
Dr. Carla Lopez del Puerto, University of Puerto Rico, Mayaguez
Dr. Alberto M. Figueroa-Medina, University of Puerto Rico at Mayaguez
Dr. Benjamin Colucci, University of Puerto Rico, Mayaguez
Ms. Rocío Juliana Sotomayor-Irizarry, University of Puerto Rico, Mayaguez

Construction Safety Training: Exploring Different Perspectives of Construction Managers and Workers
Dr. Mostafa Namian, East Carolina University
Dr. Sharareh Kermanshachi, University of Texas, Arlington
Mohammad Khalid, East Carolina University
Dr. Ahmed J. Al-Bayati, Lawrence Technological University

A Course in the Human Factors Approach to Construction Engineering and Management
Dr. Kelli R. Kopocis-Herstein, University of Nebraska, Lincoln
Dr. Terry L. Stentz, University of Nebraska, Lincoln

Student Construction Sustainability Evaluations: A LEED Lab Case Study
Dr. Jeyoung Woo P.E., California State Polytechnic University, Pomona
Dr. Hyun Woo Kim, Incheon National University
Dr. Elaine Rawley Goetz, Ohio University Office of Sustainability

R310A - CPDD Session 1 - Generating Intellectual Excitement for Professional Learners
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Continuing Professional Development Division
Moderator: Keith Plemmons,
This session of the Continuing Professional Development Division will look at bringing the university to the workplace and evaluating large online graduate-level courses. In addition, we’ll see a comparison of course delivery methods for cybersecurity education. So, don’t miss this exciting session!

Bringing the University to the Workplace: Targeted Short Course Development
Dr. Luke Fredette, Ohio State University
Ms. Emily Nutwell, Ohio State University
Dr. Scott Noll P.E., Ohio State University

A Framework for Evaluation of Large Online Graduate-Level Courses for Professional Learners
Dr. Kerrie A. Douglas, Purdue University, West Lafayette
Hillary E. Merzdorf, Purdue University, West Lafayette

Work in Progress: Comparison of ‘Boot Camp’ and Traditional Academic Course Delivery for Cybersecurity Education
Mr. Ben Bernard, North Dakota State University
Dr. Jeremy Straub, North Dakota State University

R310B - CPDD Session 2 - Professional Development - Where Are We Going?
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Continuing Professional Development Division
Moderator: Keith Plemmons,
This session of the Continuing Professional Development Division will explore the changes happening in higher education, with a special twist on career and professional development. From demographics to growth through service, this session will cause you to think about the future in new and interesting ways. So, join in the fun of continuing and professional development!

Gen Y (Millennial) and Gen Z Cultural Cohort Demographics: Social, Political and Economic Perspectives and Implications
Dr. Mitchell L. Springer PMP, SPHR, SHRM-SCP, Purdue Polytechnic Institute
Dr. Kathryne Newton, Purdue Polytechnic Institute

Growth through Service – A Longitudinal Four-Phase Natural Evolutionary Study of an Administrative Online
R313A - Design in K-12 Education
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Design in Engineering Education Division
Moderators: Molly Goldstein, University of Illinois at Urbana-Champaign; Patrick Herak, Ohio State University

Understanding How High School Students Approach Systems Design
Dr. Molly H Goldstein, University of Illinois at Urbana-Champaign
Dr. Corey T. Schimpf, Concord Consortium

Implementation of a “Near-Peer” Mentoring Program between a High School Technology Class and a University Senior Design Engineering Class
Prof. James S. Mokri P.E., San Jose State University
Dr. Nicole Okamoto, San Jose State University
Mr. Sorin Ion Neagu, Independence High School

Assessing Problem-Framing Skills in Secondary School Students Using the Needs Identification Canvas
Dr. Patrick James Herak, Ohio State University
Miss Meg E. West, Ohio State University
Dr. J. Blake Hylton, Ohio Northern University
Dr. Todd France, Ohio Northern University
Mr. Bruce Wellman, Olathe Northwest High School

R314A - Approaches to Curriculum and Policy
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Educational Research and Methods Division
Moderators: Vetria Byrd, Purdue University at West Lafayette; James Pembridge, Embry-Riddle Aeronautical University - Daytona Beach

Sustainable Collaboration Paradigms Between Math and Engineering
Dr. Afroditi Vennie Filippas, Virginia Commonwealth University
Dr. Rebecca Segal, Virginia Commonwealth University
Prof. Alen Docef, Virginia Commonwealth University

Program Assessment Through Product-based Learning in Undergraduate Engineering Programs in India
Dr. Venugopalan Kovaichelvan, TVS Institute for Quality and Leadership
Dr. Calvin Sophistus King Ph.D., Dr. Mahalingam College of Engineering and Technology

The New Engineering Education in China Based on 207 New Engineering Research and Practice Projects
Dr. Jinlu Shen, Zhejiang University
Dr. Tuoyu Li, Zhejiang University
Miss Chen Li, Zhejiang University

The Role of Prototyping in Design and Policy Making: Visual Stimuli, Selective Attention, and Decision Making
Hadi Ali, Arizona State University, Polytechnic campus

R314B - Degree Pathways and Cocurricular Experiences
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Educational Research and Methods Division
Moderators: Stephany Santos, University of Connecticut; James Pembridge, Embry-Riddle Aeronautical University - Daytona Beach

Impact of Self-efficacy and Outcome Expectations on First-year Engineering Students’ Major Selection
Baker A. Martin, Clemson University
Dr. Marisa K. Orr, Clemson University
Dr. Rachel McCord, University of Tennessee at Knoxville

Exploration of Degree Program Change: A Novel Use of Nearest Neighbor Classifiers
Dr. George D. Ricco, University Of Indianapolis
Megan Hammond, University Of Indianapolis

The Effect of Clusters of Participation in Engineering Co-curricular Activities on Student Outcomes
ASEE’S VIRTUAL CONFERENCE
THURSDAY, JUNE 25 SESSIONS
#ASEEVC

Dr. Joanna Mirecki Millunchick, University of Michigan
Yixian Zhou
What Affects Student Outcomes More: GPA or Participation in Co-curricular Activities?
Dr. Joanna Mirecki Millunchick, University of Michigan
Yixian Zhou, University of Michigan
Work in Progress: Survey Development of the Influence of Engineering Students’ Extracurricular Involvement on Career Aspirations and Professional Development
Beata Johnson, Purdue University, West Lafayette
Dr. Joyce B. Main, Purdue University, West Lafayette

R314C - Collaboration and Communication in Problem-based Learning
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Educational Research and Methods Division
Moderators: Aaron Johnson, University of Colorado Boulder; James Pembridge, Embry-Riddle Aeronautical University - Daytona Beach
The Impact of Scaffolding Prompts on the Collaborative Problem Solving of Ill-structured Tasks by Undergraduate Engineering Student Groups
Miss Taylor Tucker, University of Illinois at Urbana-Champaign
Mr. Saadeddine Shehab, University of Illinois at Urbana-Champaign
Dr. Emma Mercier, University of Illinois at Urbana-Champaign
Toward the Effective Implementation of Collaborative Problem Solving in Undergraduate Engineering Classrooms: Co-designing Guidelines for Teaching Assistants
Dr. Saadeddine Shehab, University of Illinois at Urbana-Champaign
Dr. LuEttaMae Lawrence, University of Illinois at Urbana-Champaign
Dr. Emma Mercier, University of Illinois at Urbana-Champaign
Mr. Anthony Salvatore Margotta, University of Illinois at Urbana-Champaign
Elizabeth Renee Livingston
Prof. Mariana Silva, University of Illinois at Urbana-Champaign
Miss Taylor Tucker, University of Illinois at Urbana-Champaign
Scaffolding a Team-based Active Learning Course to Engage Students: A Multidimensional Approach
Dr. Mohsen M. Dorodchi, University of North Carolina at Charlotte
Nasrin Dehbozorgi, University of North Carolina at Charlotte
Aileen Benedict, University of North Carolina at Charlotte
Erfan Al-Hossami, University of North Carolina at Charlotte
Alexandria Benedict, University of North Carolina at Charlotte
Problem-based Learning: Perceptions and Impact on Student Learning in a Sustainable Infrastructure Course
Dr. Nicole Barclay, University of North Carolina at Charlotte
Integrating Evidence-based Learning in Engineering and Computer Science Gateway Courses
Dr. Xiang Zhao, Alabama A&M University
Dr. Showkat Chowdhury, Alabama A&M University
Prof. Tamara Chowdhury, Alabama A&M University

R314D - Student Approaches to Problem Solving
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Educational Research and Methods Division
Moderators: Jakob Bruhl, United States Military Academy; James Pembridge, Embry-Riddle Aeronautical University - Daytona Beach
Making Assumptions and Making Models on Open-ended Homework Problems
Dr. Jessica E. S. Swenson, University at Buffalo
Dr. Aaron W. Johnson, University of Colorado Boulder
Ms. Mary Rola, University at Buffalo
Dr. Hoda Koushyar,
Development and Insights from the Measure of Framing Agency
Dr. Vanessa Svihiha, University of New Mexico
Amber Gallup, University of New Mexico
Dr. Sung "Pil" Kang, University of New Mexico
Work in Progress: Understanding Ambiguity in Engineering Problem Solving
Marah B. Berry, University of Florida
Dr. Elliot P. Douglas, University of Florida
Dr. David J. Therriault, University of Florida
Dr. Jeremy A. Magruder Waisome, University of Florida
Operationalizing Jonassen’s Design Theory of Problem Solving: An Instrument to Characterize Educational Design Activities
Dr. Ada Hurst, University of Waterloo
Mr. Gregory Litster, University of Waterloo
Mr. Christopher Rennick, University of Waterloo
Work in Progress: Testing an Assessment of Problem Solving in Introductory Chemical Process Design Courses
Dr. Eric Burkholder, Stanford University
Prof. Carl E. Wieman
R314E - Educational Research and Methods Division (ERM) Best Paper Finalists

11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Educational Research and Methods Division
Moderators: Elizabeth Cady, National Academy of Engineering; James Pembridge, Embry-Riddle Aeronautical University - Daytona Beach

The Influence of Connecting Funds of Knowledge to Beliefs about Performance, Classroom Belonging, and Graduation Certainty for First-generation College Students
- Dr. Dina Verdin, Purdue University, West Lafayette
- Dr. Jessica Mary Smith, Colorado School of Mines
- Dr. Juan C. Lucena, Colorado School of Mines

Redefining Retention in STEM Education: New Perspectives on a Student-centered Metric of Success
- Dr. Andrew Forney, Loyola Marymount University
- Dr. Sunai Kim, Loyola Marymount University

“Adversary or Ally”: Undergraduate Engineering Students’ Perceptions of Faculty
- Mr. H. Ronald Clements III, Purdue University, West Lafayette
- Ms. Brianna Shani Benedict, Purdue University, West Lafayette
- Ms. Dina Verdin, Purdue University, West Lafayette
- Dr. Allison Godwin, Purdue University, West Lafayette
- Ms. Jacqueline Ann Rohde, Purdue University, West Lafayette
- Sherry Chen

Effects of Test Anxiety on Engineering Students’ STEM Success
- Mr. Justin Charles Major, Purdue University, West Lafayette
- Mr. Matthew Scheidt, Purdue University, West Lafayette
- Dr. Allison Godwin, Purdue University, West Lafayette
- Dr. Edward J. Berger, Purdue University, West Lafayette
- Dr. John Chen, California Polytechnic State University, San Luis Obispo

It's the End of the World as We Know It, and I Need a Job: A Qualitative Exploration of Mid-year Engineering Students’ Future Possible Careers
- Dr. Catherine McGough, Minnesota State University, Mankato
- Dr. Lisa Benson, Clemson University

R315A - New Developments in ECE

10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Electrical and Computer Division
Moderators: Jennifer Bonniwell, Milwaukee School of Engineering; Huihui Wang, Jacksonville University

A Pedagogical Approach for Developing an Entrepreneurial Mindset in Engineering Students
- Dr. Salman Mohagheghi, Colorado School of Mines

Work in Progress: Implementing Sophomore Cornerstone Courses in Electrical and Computer Engineering
- Prof. Branimir Pejcinovic, Portland State University
- Dr. Melinda Holtzman, Portland State University
- Mr. Phillip Wong, Portland State University

Electrical and Computer Engineering Course
- Dr. Alan Johnston, Villanova University
- Prof. Edward Stephen Char Jr.

Charge Up! Wireless Power Transfer Activity for High School Students
- Mr. Akshay Sarin, University of Michigan
- Mr. Sung Yul Chu, University of Michigan
- Prof. Heath Hofmann, University of Michigan
- Prof. Al-Thaddeus Avestruz, University of Michigan

R315B - Active and Cooperative Learning in ECE

11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Electrical and Computer Division
Moderators: Jennifer Bonniwell, Milwaukee School of Engineering; Huihui Wang, Jacksonville University

Work in Progress: Incorporating Active Learning and the Entrepreneurial Mindset into a First-level Electrical Circuits Course
- Ms. Marnie Wong, Arizona State University
- Dr. Lindy Hamilton Mayled, Arizona State University

A Project-based Learning Alternative for First-year Engineering Students
- Dr. Werner Creixell, Texas A&M University
- Rachelle M. Pedersen, Texas A&M University
- Dr. Susan Niki Ritchey, Texas A&M University

An Investigation of the Effectiveness of Project-based Learning on Students’ Skills in Engineering Modeling and Design Courses
R318 - Engineering Design Graphics Division Technical Session 3
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Design Graphics Division
Moderator: Ranjeet Agarwala, East Carolina University

Strategies and Use of Instructional Aids to Improve Design Graphics Instruction

Development of a Spatial Visualization Assessment Tool for Younger Students Using a Lego™ Assembly Task
   Prof. Nathan Delson, UC San Diego
   Dr. Lelli Van Den Einde, UC San Diego and eGrove Education Inc.
   Mrs. Jessica Tuazon
   Mr. Daniel Yang, UC San Diego

Enhancing Learning of Engineering Graphics Through Gamification
   Dr. Lulu Sun, Embry-Riddle Aeronautical University

NOT Reinventing the Wheel: Product Data Management (PDM) Software Utilized as a Feedback System for Students in an Introductory Engineering Graphics Course
   Mr. David Torick, Washington State University
   Dr. Nandita Biswas, Washington State University

R319 - Engineering Economy Division Technical Session 1
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsors: Engineering Economy Division; Industrial Engineering Division; Engineering Management Division; Systems Engineering Division
Moderator: James Burns, Western Michigan University

Engineering Economy: Special topics, including teaching across engineering disciplines and open textbooks for engineering economics.

Development of an Open Textbook for Engineering Economics
   Mr. Bradley James Schmid, University of Saskatchewan

Work in Progress: Engineering Economy Taught Across Engineering Disciplines

R320 - New Areas of Ethical Inquiry
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Ethics Division
Moderator: Nebojsa Sebastijanovic, Milwaukee School of Engineering

Ethics in Undergraduate Construction Curricula: A Two-stage Exploratory Sequential Approach to Developing and Piloting the HETC Survey
   Dr. Kenneth Stafford Sands II, Florida Gulf Coast University
   Dr. Annie R. Pearce, Virginia Polytechnic Institute and State University
   Dr. Denise Rutledge Simmons P.E., University of Florida
   Dr. Min Jae Suh, Sam Houston State University
   Dr. Christine Marie Fiori, Drexel University
   Ms. Victoria A. Mouras, Virginia Polytechnic Institute and State University

Curriculum Development for Cyber Ethics with a Focus on Law Enforcement
   Dr. Joseph Benin, U.S. Coast Guard Academy
   Mr. William Randall, U.S. Coast Guard Academy

Ethics in Data Science Education
   Dr. Karen C. Davis, Miami University

Work in Progress: Ethical Responsibility Formation of Students in a Nuclear Engineering Course Through Inquiry Learning
   Ms. Minha R. Ha, York University
   Mr. Joshua Racette, McMaster University
   Prof. Shinya Nagasaki, McMaster University

R321 - Opening Up: Data, Open Access, and Open Educational Resources
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Libraries Division
Moderators: Anne Graham, University of Massachusetts Amherst; Anna Sackmann, University of California, Berkeley

Open Mines: Launching a Mini-grant Program to Incentivize Open Educational Resource Development for STEM Disciplines
   Ms. Emily A. Bongiovanni, Colorado School of Mines
   Ms. Brianna B. Buljung, Colorado School of Mines

Library Facilitation of eTextbooks in Engineering Classes:
Student Adoption and Perception
Ms. Leena N. Lalwani, University of Michigan
Mr. Paul F. Grochowski, University of Michigan
Jamie M. Niehof, University of Michigan
Dr. Craig E. Smith, University of Michigan

The Case for Data-sharing Policies and FAIR Sharing Principles: Analyzing Journals and Articles of Engineering and Medical Faculty
Chris Wiley, University of Illinois at Urbana-Champaign

Research Data Practices of Aerospace Engineering Faculty: A Qualitative Study
Fred Rascoe, Georgia Institute of Technology
Lisha Li, Georgia Institute of Technology

Publishing Behavior of Engineering Faculty
Chelsea Leachman, Washington State University
Ms. Talea Anderson, Washington State University

R322A - ET Curriculum and Programs I
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Engineering Technology Division
Moderator: Wei Zhan, Texas A&M University

Enhancing Workforce Readiness of Engineering Technicians
Prof. Christine Michelle Delahanty, Bucks County Community College
Dr. Vladimir Genis, Drexel University
Susan Herring, Bucks County Community College
Tracy A. Timby, Bucks County Community College

Graduate Program Review and Lessons Learned
Dr. Mohammad Moin Uddin P.E., East Tennessee State University
Dr. Keith V. Johnson, East Tennessee State University

Designing Coursework and Culture: Toward a Bachelor’s Degree in Engineering Technology
Ms. Kathryn Kelley, Ohio State University
Aimee T. Ulstad, Ohio State University

Identifying Congruence Between Advanced Manufacturing Two-year Curricula and Employer Needs: Findings from Five Florida State Colleges
Pallavi Ramakanth Kowligi, Florida State University
Ms. Priyanka Prajapati, Florida State University
Dr. Faye R. Jones, Florida State University
Dr. Marcia A. Mardis, Florida A&M University/Florida State University

Master Educator Program in Engineering Technology Education
Dr. Jikai Du, SUNY College at Buffalo

R323B - ET Curriculum and Programs II
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Engineering Technology Division
Moderator: Vukica Jovanovic, Old Dominion University

An Alternative Method of Teaching Process Control Courses in Electrical Engineering Technology Programs
Dr. Yoonill Lee, Purdue University Northwest

Curriculum Development for Robotics Technology Program
ASEE’S VIRTUAL CONFERENCE
THURSDAY, JUNE 25 SESSIONS

Dr. Sanjeevi Chitikeshi, Old Dominion University
Dr. Shirshak K. Dhali P.E., Old Dominion University
Mrs. Betsey Odell, Commonwealth Center for Advanced Manufacturing
Dr. Vukica M. Jovanovic, Old Dominion University
Dr. Cheng Y. Lin P.E., Old Dominion University

Development of Senior Design Sequence with Integration of Undergraduate Research Component
Dr. Ilya Y. Grinberg, SUNY Buffalo State

FEA Taught the Industry Way
Dr. John L. Irwin, Michigan Technological University
Dr. David Michael Labyak, Michigan Technological University

Redesign of an Embedded System Course for Electrical Engineering Technology Undergraduate Program
Dr. Suranjan Panigrahi, Purdue University, West Lafayette

R324 - ENT Division Technical Session: Competitions, Challenges, and Teams
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Technology Division
Moderator: Carmen Cioc, The University of Toledo

A Scalable Approach to Student Team Formation for Innovation-based Learning
Ryan Striker P.E., North Dakota State University
Mr. Enrique Alvarez Vazquez, North Dakota State University
Mary Pearson, North Dakota State University
Ms. Lauren Singelmann, North Dakota State University
Ms. Ellen M. Swartz, North Dakota State University

A Summer Program Focused on Developing an Entrepreneurial Mindset in the Context of the NAE Grand Challenges for Engineering
Dr. Jared Schoepf, Arizona State University
Dr. Stephanie M. Gillespie, University of New Haven
Amy Trowbridge, Arizona State University
Dr. Alison Cook-Davis, Arizona State University
Mrs. Kristen Peña, Arizona State University
Ms. Courtney Argenti, Arizona State University
Dr. Daniel J. Laxman, Arizona State University

KEEN Engineering Skill Set and Competition Teams Success: Creating Value Through the Co-curriculum
Dr. Julia M. Williams, Rose-Hulman Institute of Technology
Dr. William A. Kline, Rose-Hulman Institute of Technology

The Relationship Between Teamwork and Innovation Outcomes in an Engineering Thermal Science Course: An Entrepreneurial Mindset Simulation
Ms. Thien Ngoc Y. Ta, Arizona State University
Dr. Gary Lichtenstein, Arizona State University
Dr. Ryan James Milcarek, Arizona State University

To Start or Not: Impact of Engineering Students’ Engagement in Entrepreneurship Competitive Activities on Their Entrepreneurial Intentions
Miss Yaxin Huang, Shanghai Jiao Tong University
Prof. Jiabin Zhu, Shanghai Jiao Tong University
Dr. Zhinan Zhang, Shanghai Jiao Tong University

Insights About an Academic Elevator Pitch Competition in Undergraduate Engineering Curricula
Mrs. Sandra Furnbach Clavijo, Stevens Institute of Technology
Matthew Wade, Stevens Institute of Technology
Dr. Kishore Pochiraju, Stevens Institute of Technology

Schedule subject to change. Please go to www.asee20.pathable.co for up-to-date information
R327A - First-Year Programs: Unique Projects & Pedagogies
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: First-Year Programs Division
Moderators: Andrew Bartolini, University of Notre Dame; Rebekah Dupont, Learn about innovative projects and pedagogies being implemented in the first year.

Creation of "The Engineering Student Experience Podcast" to Enhance Engineering Student Readiness for School and the Workforce
  Dr. Paul Morrow Nissenson, California State Polytechnic University, Pomona
  Dr. Jessica Ohanian Perez, California State Polytechnic University, Pomona
  Mr. Cesar Moreno

Work in Progress: Inquiry-Based Lessons for Introduction to Engineering Instruction
  Dr. Michelle M. Blum, Syracuse University

Introducing Industrial Systems Engineering to First-Year Students via Mr. Potato Head
  Tyler Milburn, Ohio State University
  Cassie Wallwey, Ohio State University
  Dr. Michael Parke, Ohio State University

Work in Progress - Integration of Voice Technology into the First-Year Engineering Curriculum
  Dr. Jaskirat Sodhi, New Jersey Institute of Technology
  Dr. Ashish D. Borgaonkar, New Jersey Institute of Technology
  Mr. Ludvik Alkhoury, New Jersey Institute of Technology
  Nicole Bosca

Complete Evidence-Based Practice Paper: The Impact of Information Literacy Instruction on the Synthesis Level of First-Year Engineering Students
  Dr. Jessica Ohanian Perez, California State Polytechnic University, Pomona
  Mr. Paul R. Hottinger, California State Polytechnic University, Pomona

R327B - First-Year Programs: Design in the First Year
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: First-Year Programs Division
Moderators: Mirna Mattijsk, Colorado School of Mines; Ann Saterbak, Duke University

Work in Progress: Development of a General Education First-Year Design Course
  Dr. Courtney Hollar, Boise State University
  Dr. Sondra M Miller, Boise State University

Work in Progress: Project and Design-Based Introductory Engineering Course using Arduino Kits
  Dr. Demetris Geddis, Hampton University
  Dr. Brian Aufderheide, Hampton University
  Mr. Herman W. Colquhoun Jr., IBM Canada Ltd.

Walking on Water Term Design Project in Fundamentals of Engineering
  Dr. Djedjiga Belfadel, Fairfield University
  Dr. Michael Zabinski, Fairfield University
  Dr. Ryan Munden, Fairfield University

Work in Progress: Introducing Design Thinking in First-Year Engineering Education
  Dr. Keyanoush Sadeghipour, Temple University
  Dr. David Brookstein, Temple University
  Dr. Shawn Fagan, Temple University
  Cory Budischak, Temple University

Teaching Human-centered Design to Engineers: Continuous Improvement in a Cornerstone Course
  Prof. Catalina Cortázar, P. Univ. Católica de Chile

R327C - First-Year Programs: Metacognition, Self-Efficacy, and Motivation #1
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: First-Year Programs Division
Moderators: Scott Streiner, Rowan University; Philip Brown, Rutgers, The State University of New Jersey

A Multidimensional Approach to Understanding the Development of Design Skills, Knowledge, and Self-Efficacy
  Dr. Vanessa Svhila, University of New Mexico
  Dr. Pil Kang, University of New Mexico
  Dr. Yan Chen, University of New Mexico
Chen Qiu, University of New Mexico
Jordan Orion James, University of New Mexico

Examining the Connection Between Student Mastery Learning Experiences and Academic Motivation
Cara Mawson, Rowan University
Dr. Cheryl A. Bodnar, Rowan University
Dr. Scott Streiner, Rowan University

Work in Progress: Formation of an Engineering Identity in First-year Students through an Intervention Centered on Senior Design Projects
Dr. Abigail M. Richards, Montana State University
Dr. Ryan Anderson, Montana State University
Dr. Carrie B. Myers, Montana State University

Investigation of Sense of Belonging to Engineering in Introductory-Level Pre-Engineering Classes
Jill Davishahl, Western Washington University
Dr. Sura Alqudah, Western Washington University

Qualitative and Quantitative Impact of Metacognitive Interventions in Supplemental Instruction Sessions
Miss Nisha Abraham, University of Texas at Austin
Dr. Nina Kamath Telang, University of Texas at Austin

R327D - First-Year Programs: Peer Mentoring
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: First-Year Programs Division
Moderators: Sonia Bartolomei-Suarez, University of Puerto Rico, Mayaguez Campus; Jaskirat Sodhi, New Jersey Institute of Technology

Peer Mentoring, Learning Strategies Course, and Online Math-Help Module to Increase Retention in School of Engineering
Prof. Corey Kiassat, Quinnipiac University
Prof. Ruby Elkharboutly, Quinnipiac University

Student Relationships: A Social Network Analysis
Dr. Noah Salzman, Boise State University
Ms. Ann E. Delaney, Boise State University
Mrs. Catherine Rose Bates
Dr. Donna C. Llewellyn, Boise State University

Implementation of an Introductory Engineering Course and its Impact on Students’ Academic Success and Retention
Rezvan Nazempour, University of Illinois at Chicago
Prof. Houshang Darabi, University of Illinois at Chicago
Dr. Renata A. Revelo, University of Illinois at Chicago
Dr. Peter C. Nelson, University of Illinois at Chicago
Dr. Anthony E. Felder, University of Illinois at Chicago
Prof. Didem Ozevin P.E., University of Illinois at Chicago
Prof. Jeremiah T. Abiade, University of Illinois at Chicago

Effectiveness of Undergraduate Teaching Assistants in a First-Year Design Course
Ms. Lakshmy Mohandas, Purdue University
Prof. Nathan Mentzer, Purdue University
Ms. Aparajita Jaiswal, Purdue University
Mr. Shawn Farrington, Purdue University

Friendly Mentor or Former Consultant: Peer Mentors in First-Year Engineering Courses
Dr. Leila Keyvani Someh, Northeastern University
Brian Patrick O’Connell, Northeastern University
Dr. Kathryn Schulte Grahame, Northeastern University
Mr. Jake Levi, Northeastern University
Whitney Elise Hansberry
Mr. Vishrudan Swami

R327E - First-Year Programs: Metacognition, Self-Efficacy, and Motivation #2
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: First-Year Programs Division
Moderators: Natalie Van Tyne, Virginia Polytechnic Institute and State University; Seach Chyr (Ernest) Goh, University of British Columbia, Okanagan

Why Motivation Matters: The Relationship Between Motivation to Go to College, Effort, and Academic Performance in Early Engineering Courses
Woo J. Kim, Miami University
Ms. Brielle Nikole Johnson, Miami University
Dr. Jennifer Blue, Miami University
Dr. Amy Summerville, Miami University
Dr. Brian P. Kirkmeyer, Miami University

Work-In-Progress: Engineering Self-Efficacy in First-Year Design
Megan Gray, Duke University
Dr. Ann Saterbak, Duke University
Dr. Sophia T. Santillian, Duke University
Michael Rizk, Duke University
Dr. Jessica Sperling, Duke University

How Do Student Perceptions of Engineers and Engineering as a Career Relate to their Self-Efficacy, Career Expectations, and Grittiness?
Dr. Melissa Lynn Morris, University of Nevada, Las Vegas
Mr. Joseph Dygert, West Virginia University
R330A - Computing and Information Technology Division Technical Session 6
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Computing and Information Technology Division
Moderators: Reza Sanati-Mehrizy, Utah Valley University; Vetria Byrd, Purdue University at West Lafayette

This session presents papers on a variety of topics pertaining to computing and information technology.

Deploying a Network Management Overlay for Education Video Conferencing Services
Ciprian Popoviciu, East Carolina University
Dr. Philip J. Lunsford II, East Carolina University
Dr. John Pickard, East Carolina University
Mr. Colby Lee Sawyer, East Carolina University
Mr. Jarvis Woodburn
Mr. Zachary Ryan Zynda, East Carolina University
Mr. Dale Drummond, East Carolina University

Developing Information Technology Labs on Google Cloud Platform
Dr. Peng Li, East Carolina University

Drawn Together: Integrating Words with Visuals While Annotating Textbooks and Articles for Strengthening Competencies in Computer Networking Technology
Dr. Vigyan Jackson Chandra, Eastern Kentucky University

Integration of Instructional Technology Tools Including Matlab Grader to Enhance Learning in a Hybrid Vibrations Course
Dr. Natasha Smith P.E., University of Virginia

R330B - Computing and Information Technology Division Technical Session 7
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Computing and Information Technology Division
Moderators: Awatif Amin, Johnson C. Smith University; Chandra Asthana, Elizabeth City State University

This session presents papers on a variety of topics pertaining to computing and information technology.

Exploring Ethical Hacking from Multiple Viewpoints
Dr. Radana Dvorak, University of Portland
Dr. Heather Dillon, University of Portland
Dr. Nicole Ralston, University of Portland
Jeffrey Matthew Welch, University of Portland

An Empirical Study for Multilevel Cache Associativity
Dr. Hassan Rajaee, Bowling Green State University

The CAHSI INCLUDES Alliance: Realizing Collective Impact
Dr. Elsa Q. Villa, University of Texas at El Paso
Dr. Ann C. Gates, University of Texas at El Paso
Dr. Sanga Kim, University of Texas at El Paso
Prof. David S. Knight, University of Washington

Curri: A Curriculum Visualization System that Unifies Curricular Dependencies with Temporal Student Data
Dr. Stephen Michael MacNeil, University of California, San Diego
Dr. Mohsen M. Dorodchi, University of North Carolina at Charlotte
Erfan Al-Hossami, University of North Carolina at Charlotte
Aileen Benedict, University of North Carolina at Charlotte
Mr. Devansh Desai, University of North Carolina at Charlotte
Mohammad Javad Mahzoon, Core Compete Inc.

R332A - International Research Experiences Intl Div Tech Session 8
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: International Division
Moderators: Amal Kabalan, Bucknell University; Yanjun Yan, Western Carolina University

This session discusses lessons learned in past international research experiences and specific programs in Korea and the United Kingdom.

Undergraduate Students as Visiting Students in the United Kingdom
Prof. Ali Mehrizi-Sani, Virginia Tech
R332B - Factors Influencing Curriculum Development: International Division Technical Session 4
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: International Division
Moderators: Sanjay Tewari, Missouri University of Science and Technology; Phillip Sanger, Purdue University at West Lafayette

This session covers issues that impact curriculum development, such as social interaction, the importance of reflection, and group dynamics.

A Comparative Study of Curricular Differences and Their Influence on Students’ Formation as Engineers
Dr. Ashish Agrawal, University of Cape Town
Dr. Johnson Carroll, University of Johannesburg
Dr. Jennifer M. Case, Virginia Polytechnic Institute and State University
Dr. Nicole P. Pitterson, Virginia Polytechnic Institute and State University

Lessons Learned from the NSF IGERT Program: Cultivating Student Motivation in the Interdisciplinary and International Contexts
Congying Wang, Purdue University, West Lafayette
Caitlyn M. Clarkson, Purdue University, West Lafayette
Mr. Joseph Andler, Purdue University, West Lafayette
Mr. Matthew Korey, Purdue University
Ms. Kali D. Frost, Purdue University
Dr. Melissa S. Reeves, Tuskegee University
Carol A. Handwerker, Purdue University

Research on the Construction of Excellent Classes for College Students in China in the New Era
Mrs. Zhi Fang, Beihang University
Prof. Qing Lei, Beihang University

Role of Social Interaction in the Barriers Facing First-year International Students in the United States
Mr. Johnny Crayd Woods Jr., Virginia Polytechnic Institute and State University
Dr. Homero Murzi, Virginia Polytechnic Institute and State University
Ms. Maia Greene-Havas, Virginia Polytechnic Institute and State University
Mr. Abram Diaz-Strandberg, Virginia Tech Department of Engineering Education
Sophia Vicente, Virginia Polytechnic Institute and State University

WIP: The Development and Implementation of Self-reflection Participation Logs in an English-taught Engineering Program in China
Dr. Nicole L. Ramo, University of Michigan
Dr. Eric Scott Hald, Shantou University
Dr. Aileen Huang-Saad, University of Michigan
Prof. Qiang Fang, Shantou University

R333A - Pre-college Engineering Education Division Technical Session 9
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Pre-College Engineering Education Division
Moderator: Manuel Figueroa, The College of New Jersey
WIP: First-graders’ Computational Thinking in Informal Learning Settings
Ms. Hoda Ehsan, Purdue University, West Lafayette
Ms. Barbara Fagundes, Purdue University, West Lafayette
Prof. Tamara J. Moore, Purdue University, West Lafayette
Kristina Maruyama Tank, Iowa State University
Dr. Monica E. Cardella, Purdue University, West Lafayette

WIP: Initial Investigation of Effective Teacher Professional Development Among Experienced and Nonexperienced Engineering Teachers
Dr. Jennifer L. Kouo, Towson University
Dr. Medha Dalal, Arizona State University
Dr. Bruk T. Berhane, Florida International University
Dr. Jumoke ‘Kemi’ Ladeji-Osias, Morgan State University
Dr. Kenneth Reid, Virginia Polytechnic Institute and State University
Prof. Cheryl Beauchamp, Regent University
Dr. Adam R. Carberry, Arizona State University
ASEE’S VIRTUAL CONFERENCE
THURSDAY, JUNE 25 SESSIONS

#ASEEVC

Dr. Stacy S. Klein-Gardner, Vanderbilt University
Briana O’Neal, University of Maryland College Park

**WIP: Relationship Between Students’ Demographics and Manufacturing Career Perceptions**
Miss Chidubem Nuela Enebechi, Purdue University, West Lafayette
Dr. Greg J. Strimel, Purdue University, West Lafayette
Ms. Liesl Krause, Purdue University, West Lafayette
Miss Sydney Taylor Serban, Purdue University, West Lafayette

**WIP: Roll-the-Roller 3-D Printing Design Contest: The Experience-based Summer Bridge Program to Improve the Success of Incoming Engineering Freshmen Students**
Dr. Hitesh D. Vora, Oklahoma State University
Mr. Aaron Alexander, Oklahoma State University
Dr. Ilchung Park, Oklahoma State University
Dr. Chulho Yang, Oklahoma State University
Dr. Avimanyu Sahoo, Oklahoma State University
Dr. Young Bae Chang P.E., Oklahoma State University

**WIP: Student Dispositions Toward STEM: Exploring an Engineering Summer Camp for Underrepresented Students**
Dr. Jeanne R. Wiesemann, Southern Methodist University
Prof. Richard Duschl, Southern Methodist University
Miss Kristine Reiley, Southern Methodist University
Dr. Kenneth Berry, Southern Methodist University

**R333B - Pre-college Engineering Education Division Technical Session 10**
**11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE**

**Sponsor: Pre-College Engineering Education Division**
**Moderator: Bradley Bowen, Virginia Polytechnic Institute and State University**

**WIP: Teacher Leader Engineering Network (TaLENt): A Collective Impact Model for K-12 Engineering Teacher Leaders**
Christina Anlynette Crawford, Rice University
Carolyn Nichol, Rice University
Dr. Robert Wimpelberg, University of Houston
Dr. Jean S. Larson, Arizona State University
Dr. Alison Cook-Davis, Arizona State University

**WIP: Understanding Impact of a Design-thinking Intervention on Students’ Resilience**
Dr. Kristin Maria Repchick, Industrial/Organizational Psychology Consultant
Lauren Q. DiBianca Frye, Forsyth Country Day School
Dr. Elise Barrella P.E., Wake Forest University

**WIP: A Summer Outreach Program in Chemical Engineering Emphasizing Sustainable Technologies Related to Plastic Materials**
Dr. Diane L. Nelson, Carnegie Mellon University
Dr. Ilhem F. Hakem, Carnegie Mellon University

**WIP: Young Adolescent Perceptions of Engineers Within a Summer Outreach Program**
Ms. Selene Y. Willis, University of South Florida
Dr. Tonisha B. Lane, Virginia Polytechnic Institute and State University
Dr. Eugenia Vomvoridi-Ivanović
Salam Ahmad
Dr. Jonathan Elliot Gaines, University of South Florida
Mrs. Ahmirah Samayah Muhammad, BullsEYE Head Program Coordinator

**Children’s Perceptions of Manufacturing Careers: Examining the Influence of Industry-Public Education Initiatives**
Dr. Greg J. Strimel, Purdue University, West Lafayette
Ms. Liesl Krause, Purdue University, West Lafayette
Miss Sydney Taylor Serban, Purdue University, West Lafayette

**R333C - Pre-college Engineering Education Division Technical Session 11**
**11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE**

**Sponsor: Pre-College Engineering Education Division**
**Moderator: Andrea Burrows, University of Wyoming**

**Using Computer-generated Concept Maps in the Engineering Design Process to Improve Physics Learning**
Mr. Michael S. Rugh, Texas A&M University
Mr. Donald Joseph Beyette, Texas A&M University
Dr. Mary Margaret Capraro, Texas A&M University
Dr. Robert M. Capraro, Texas A&M University

**Teaching Science Using Dye-sensitized Solar Cell Kit**
Mr. Thomas Neil Dempsey, Forestville Central School
Mr. M. Raymond Ng, Cathedral Preparatory School
Mr. Zachary Rhodes
Dr. Jiawei Gong, Pennsylvania State University
Dr. Faisal Aqlan, Pennsylvania State University

**Broadening the Participation of Rural Students in Engineering: Exploring Community Perspectives**
Stacey L. Vaziri, Virginia Polytechnic Institute and State University
Dr. Marie C. Paretti, Virginia Polytechnic Institute and State University
Dr. Jacob R. Grohs, Virginia Polytechnic Institute and State University
Dr. Liesl M. Baum, Virginia Polytechnic Institute and State University
Dr. Marlena McGlothlin Lester, Virginia Polytechnic Institute and State University
Dr. Phyllis Leary Newhill

Professional Development for K-12 Math Teachers and Its Immediate Effect on Engineering Self-efficacy
Miss Sana M. Syed, Saint Louis University
Dr. J. Chris Carroll, Saint Louis University
Dr. Shannon M. Sipes, Indiana University
Mrs. Traci Aucin
Adrienne Enriquez, Oregon GEAR UP
Miss Kelsey Z. Musa, Saint Louis University
Ms. Rachel Bultas

Ohio Technology Education Status Study
Joanne Baltazar Vakil, Ohio State University
Dr. Paul E. Post, Ohio State University

R333D - Pre-college Engineering Education Division Technical Session 12
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Pre-College Engineering Education Division
Moderator: Mike Borowczak, University of Wyoming

An Integrated Three-year High School STEM Curriculum Based on the Global Grand Challenges (Resource Exchange)
Dr. Katherine Levenick Shirey, Knowles Teacher Initiative

Art Bots (Resource Exchange)
Ms. Emma Michelle Monson, University of St. Thomas
Dr. Deborah Besser P.E., University of St. Thomas
Dr. AnnMarie Thomas, University of St. Thomas
Dr. Debra Monson, University of St. Thomas

Boat Float Engineering Design (Resource Exchange)
Ms. Krista Schumacher, University of St. Thomas
Dr. Deborah Besser P.E., University of St. Thomas
Dr. AnnMarie Thomas, University of St. Thomas

Chemical Engineering for Middle School Girls (Resource Exchange)
Ayse Asatekin, Tufts University
Ms. Isadora Shamah, Tufts University
Miss Abigail Anne Klotz,
Dr. Merredith D. Portsmore, Tufts University
Michael Forte, Tufts University
Mr. Russell Lincoln Shute,

Circuits and Our Environment (Resource Exchange)
Elise Rodich, University of St. Thomas
Dr. Deborah Besser P.E., University of St. Thomas
Dr. AnnMarie Thomas, University of St. Thomas

R334A - Ethical and Global Concerns
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Liberal Education/Engineering & Society Division
Moderator: Juan Lucena, Colorado School of Mines

Emergence and Evolution of Humanitarian Engineering Education in Australia
Ms. Ellen Lynch, Australian National University
Dr. Jeremy Ingle Smith, Australian National University

Ethics by the Dose: Medical Treatment Metaphor for Ethics in Engineering
Dr. Elizabeth A. Reddy, Colorado School of Mines
Dr. Stephen Campbell Rea, Colorado School of Mines
Dr. Qin Zhu, Colorado School of Mines

Teaching Ethical Photography to Deepen Global Engineering Competency
Dr. Robert S. Emmett, Virginia Polytechnic Institute and State University
Dr. Homero Murzi, Virginia Polytechnic Institute and State University
Dr. Natasha B. Watts, Virginia Polytechnic Institute and State University

WIP: Liberal Arts Help Engineering Students Change the World
Dr. Alison Wood, Franklin W. Olin College of Engineering
Dr. Robert Martello, Franklin W. Olin College of Engineering

R334B - Programmatic Integration of Liberal Education
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Liberal Education/Engineering & Society Division
Moderator: Judith Norback, Georgia Institute of Technology

Exploring an Active-learning Focus in a Liberal Arts Engineering Curriculum
Dr. David Robert Bruce P.E., Fulbright University Vietnam
Dr. Sebastian Dziallas, Fulbright University Vietnam

Introducing an Engineering Program in an Emphatically
Liberal Arts Institution
- Prof. Michael Oudshoorn, High Point University
- Dr. Claire Lynne McCullough P.E., High Point University

The Sociotechnical Core Curriculum: An Interdisciplinary Engineering Studies Degree Program
- Dr. Jenn Stroud Rossmann, Lafayette College
- Dr. Kristen L. Sanford P.E., Lafayette College
- Prof. Julia Nicodemus, Lafayette College
- Benjamin Cohen, Lafayette College

Program: Study Design
- Ms. Rebecca Balakrishnan, University of Manitoba
- Dr. Jillian Seniuk Cicek, University of Manitoba
- Prof. Priya Subra Mani

R335A - Learning Strategies
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Manufacturing Division
Moderator: Zhenhua Wu, Virginia State University

Teaching Geometric Dimensioning and Tolerancing by Using an Algorithm to Implement the Datum-based Model
- Dr. Wangping Sun, Oregon Institute of Technology
- Prof. Yanqing Gao, Oregon Institute of Technology

Improvement of Students’ Performance in Manufacturing Processes Laboratory by Applying Spaced Practice Strategy
- Ms. Yareni P. Lara-Rodriguez, University of Puerto Rico, Mayaguez Campus
- Dr. Pedro O. Quintero, University of Puerto Rico, Mayaguez Campus

Using Kaizen Process to Improve Learning Outcomes Manufacturing Simulation Projects
- Dr. Zhenhua Wu, Virginia State University
- Dr. Amir Javaheri, Virginia State University

Teaching Assembly Planning Using AND/OR Graph in a Design and Manufacture Lab Course
- Dr. Khalifa H. Harib, United Arab Emirates University
- Dr. Sangarappillai Sivaloganathan, United Arab Emirates University
- Mr. Hayder Zulafqar Ali, United Arab Emirates University
- Dr. Bobby Mathew, United Arab Emirates University

R335B - Advances in Additive, Hybrid, and Digital Manufacturing Education
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Manufacturing Division
Moderator: Aditya Akundi, The University of Texas Rio Grande Valley

MAKER: Designing and Building the Classical Inverted Pendulum on a Cart
- Dr. Khalifa H. Harib, United Arab Emirates University
- Dr. Sangarappillai Sivaloganathan, United Arab Emirates University
- Mr. Adewale Oriyomi Oseni, United Arab Emirates University

The Manufacturing Education Dilemma: Operating Efficiency vs. Productivity
- Prof. Robert Simoneau

Remotely Accessible Injection Molding Machine for Manufacturing Education: Lessons Learned
- Dr. Sheng-Jen “Tony” Hsieh, Texas A&M University

Teaching High School Students Innovative Topics Related to Advanced Manufacturing and 3-D Printing
- Dr. Ahmed Cherif Megri, North Carolina A&T State University
- Dr. Sameer Hamoush, North Carolina A&T State University

R336 - Materials Division Technical Session 3
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Materials Division
Moderators: Alison Polasik, The Ohio State University; Lessa Grunenfelder, University of Southern California

Enhancing Student Learning Through Pre-lab Assignments and Virtual Reality/Simulation Components in the Strength of Materials Laboratory Experiments
- Dr. Afshin H. Zahraee, Purdue University Northwest

Impact of Integrating Computation into Undergraduate Curriculum: New Modules and Long-term Trends
- Ms. Grace M. Lu, University of Illinois at Urbana-Champaign
- Prof. Dallas R. Trinkle, University of Illinois at Urbana-Champaign
- Prof. Andre Schleife, University of Illinois at Urbana-Champaign
- Dr. Cecilia Leal, University of Illinois at Urbana-Champaign
- Prof. Jessica Krogstad, University of Illinois at Urbana-Champaign
- Prof. Robert Maass, University of Illinois at Urbana-Champaign
R338A - Mechanical Engineering Technical Session: The Remote World

11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Mechanical Engineering Division
Moderator: Diane Peters, Kettering University

This technical session address the timely topic of remote learning and presents ideas on how to improve the educational experience through video lectures, virtual office hours, and out-of-class assignment frequency.

Effects of Out-of-Class Assignment Frequency on Course Performance in Mechanical Engineering Undergraduates
Dr. Kevin Skenes, The Citadel
Dr. Jason Howison, The Citadel
Dr. Emily Kate Bierman, The Citadel

Faculty Perspectives on the Impact of Virtual Office Hours in Engineering Courses
Ms. Brooke-Lynn Caprice Andrade,
Dr. Krishna Pakala, Boise State University
Dr. Diana Bairaktarova, Virginia Polytechnic Institute and State University
Mr. Douglas Hagemeier, Boise State University
Prof. Harish Subbaraman, Boise State University

A Curriculum-spanning Review Video Library to Improve Retention of Prerequisite Course Material
Dr. Hope Leigh Weiss, California State University, Fullerton
Dr. John W. Sanders, California State University, Fullerton

R338B - Mechanical Engineering Technical Session: Curriculum and Education

11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Mechanical Engineering Division
Moderator: Maryam Darbeheshti, University of Colorado Denver

This technical session focuses on mechanical engineering curriculum and education. An overview of mechanical engineering in the U.S. will first be presented followed by papers on revolutionizing the mechanical engineering curriculum and the impacts of shifting student perspectives.

Mechanical Engineering Undergraduate Education in the United States
Dr. Chean Chin Ngo, California State University, Fullerton
Dr. Sang June Oh, California State University, Fullerton

Revolutionizing Mechanical Engineering Undergraduate Curriculum
Shelby Ann McNeilly, Boise State University
Dr. Krishna Pakala, Boise State University
Dr. Donald Plumlee P.E., Boise State University

Shifting Perspectives on Acceptable Classroom Behavior
Dr. Randall D. Manteufel, University of Texas at San Antonio
Dr. Amir Karimi P.E., University of Texas at San Antonio

WIP: Design of Polymer Processing Learning Module in a Manufacturing Course for Mechanical Engineers
Dr. Michele Miller, Campbell University

R338C - Mechanical Engineering Technical Session: Feeling the Heat - Thermodynamics and Heat Transfer

11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Mechanical Engineering Division
Moderator: Matt Gordon, University of Denver

All things thermodynamics and heat transfer. This session considers pedagogy, assessment, and projects all in the context of thermodynamics and heat transfer.

A Visual and Intuitive Approach to Teaching and Learning the Concept of Thermodynamic Entropy
Dr. Daniel Raviv, Florida Atlantic University
Mr. Daniel Ryan Barb, Florida Atlantic University

Examining Knowledge Transfer Between Thermodynamics and Mathematics
Dr. Alexander John De Rosa, Stevens Institute of Technology

Implementing Competency-based Assessment in an
Undergraduate Thermodynamics Course
Dr. Nicole Okamoto, San Jose State University

Thermal Analysis of Heat Sinks with Metal 3-D Printer
Dr. Haejune Kim, Texas A&M University

Increasing Student Curiosity with Cooling Systems
Dr. Jordan Farina, University of Portland
Dr. Heather Dillon, University of Portland
Rebecca D. Levison, University of Portland
Dr. Nicole Ralston, University of Portland

R339 - Learning Mechanics Through Experimentation
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Mechanics Division
Moderators: Brian Self, California Polytechnic State University, San Luis Obispo; Amie Baisley, University of Florida

Work in Progress: Developing Mechanics of Materials Skills through an Integrated Prototyping Project
Dr. Ethan Hilton, Louisiana Tech University

Simple Lab Exercises Using Composite Materials
Dr. William E. Howard, East Carolina University
Dr. Colleen Janeiro, East Carolina University

Effective PocketLab Sensor Use in an Engineering Dynamics Course
Dr. Timothy Aaron Wood, The Citadel

Play-Doh and Pendulums: Making Mass Moment of Inertia Fun
Dr. Kathleen Bieryla, University of Portland
Ms. Nikolene A. Schulz P.E., University of Portland
Rebecca D. Levison, University of Portland
Dr. Heather Dillon, University of Portland

R340B - Minorities in Engineering Division Technical Session 8
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Minorities in Engineering Division
Moderators: Elizabeth Cady, National Academy of Engineering; Elizabeth Cady, National Academy of Engineering

WIP: Leaving Engineering: An Examination of the Reasons that Influence Black Women to Depart
Harriet Paige Brown, Purdue University, West Lafayette
Ms. Jacqueline Ann Rohde, Purdue University, West Lafayette
Dr. Allison Godwin, Purdue University, West Lafayette

WIP: Mitigating Transfer Shock for Undergraduates in Engineering to Increase Diversity
Mrs. Claire Duggan, Northeastern University
Ms. Rachelle Reisberg, Northeastern University
Mr. Richard R. Harris, Northeastern University
Brad Lehman
Dr. Russell Faux
Mr. Luis Rafael Frias II
Prof. Marilyn Minus

WIP: (Not) Feeling Lonely in a Team: Implementation and Assessment of Equitable Team Formation Practices
Arnold Deffo, California Polytechnic State University, San Luis Obispo
R341A - Mechatronics and Robotics II
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Multidisciplinary Engineering Division
Moderators: Carlotta Berry, Rose-Hulman Institute of Technology; Leah Newman, Milwaukee School of Engineering

This session highlights efforts to define and expand the diverse field of mechatronics and robotics and includes examples of projects and workshops. It is the second of two sessions devoted to the topic; discussion between authors and attendees is anticipated.

Workshops for Building the Mechatronics and Robotics Engineering Education Community

Prof. Michael A. Gennert, Worcester Polytechnic Institute
Dr. Nima Lotfi, Southern Illinois University, Edwardsville
Dr. James A. Mynderse, Lawrence Technological University
Dr. Monique Jethwani, Columbia School of Social Work
Dr. Vikram Kapila, New York University

Promoting Open-source Hardware and Software Platforms in Mechatronics and Robotics Engineering Education

Dr. Nima Lotfi, Southern Illinois University, Edwardsville
Mr. Kenechukwu Churchill Mbanisi, Worcester Polytechnic Institute
Dr. David M. Auslander, University of California, Berkeley
Dr. Carlotta A. Berry, Rose-Hulman Institute of Technology
Dr. Luis Alberto Rodriguez, Milwaukee School of Engineering
Dr. Majid Molki, Southern Illinois University, Edwardsville

Robot Racing from Targeted Kit-based Components to a Functional System

Dr. Luis Alberto Rodriguez, Milwaukee School of Engineering
Dr. Michael D. Cook, Milwaukee School of Engineering
Dr. William C Farrow, Milwaukee School of Engineering

WIP: Mechatronics and Robotics Engineering Definitions Among Students, Educators, and Industry Professionals

Dr. James A. Mynderse, Lawrence Technological University
Dr. Nima Lotfi, Southern Illinois University, Edwardsville
Dr. Nikhil Bajaj, University of Pittsburgh
Dr. Vishesh Vikas, University of Alabama
Prof. Michael A. Gennert, Worcester Polytechnic Institute

R341B - Multidisciplinary Curriculum and Course Development
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Multidisciplinary Engineering Division
Moderators: John Foo, Columbia University in the City of New York; Svetlana Mitrovski, University of Illinois at Urbana - Champaign

Development and Implementation of an Integrative Engineering Program at Lafayette College
Dr. David Brandes, Lafayette College
Dr. Lauren Sefcik Anderson, Lafayette College

Building a New University at the Intersection of Liberal Arts and Engineering
Dr. Sebastian Dziallas, Fulbright University Vietnam
Prof. Naoko Ellis P.Eng., University of British Columbia
Dr. David Robert Bruce P.E., Fulbright University Vietnam

Implementing the NEET Ways of Thinking at MIT and Assessing Their Efficacy
Dr. Edward F. Crawley, Massachusetts Institute of Technology
Prof. Mark Bathe, Massachusetts Institute of Technology
Dr. Rea Lavi, Massachusetts Institute of Technology
Dr. Amitava "Babi" Mitra, Massachusetts Institute of Technology

Self-initiative Undergraduate Research
Dr. Chris A. O’Riordan-Adjah, Wake Technical Community College

Using an Education Ideas Forum to Foster Institutional Innovation Starting from the Grassroots Level
Dr. Adeel Khalid, Kennesaw State University
Dr. Tris Utschig, Kennesaw State University

R342 - New Engineering Educators 2: Success In and Out of the Classroom
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: New Engineering Educators Division
Moderators: Vimal Viswanathan, San Jose State University; Kerry Widder, Milwaukee School of Engineering

A Literature-based Perspective Towards Learning and Pedagogy of Computational Thinking
Ms. Huma Shoaib, Purdue University, West Lafayette
Dr. Sean P. Brophy, Purdue University, West Lafayette

Implementation of a Future Faculty Development Program:
Impact and Evaluation of Years 1 & 2
Dr. David Gau, University of Pittsburgh
Ms. Deanna Christine Easley Sinex, University of Pittsburgh
Dr. Mary E. Besterfield-Sacre, University of Pittsburgh
Dr. Steven Abramowitch, University of Pittsburgh
Dr. Sylvanus N. Wosu, University of Pittsburgh

What No One Tells You About Writing a CAREER Proposal: Advice from a Former Program NSF Officer
Dr. Julie P. Martin, Ohio State University

Writing Good Reflection Questions: Testing Brookfield’s Critical Incident Questionnaires’ Effectiveness in Improving Student Learning
Dr. Elizabeth Payne Tofole, South Dakota State University
Dr. Albena Yuliyanova Yordanova, South Dakota State University

R351 - Women in Engineering Division Technical Session 4
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE

Unpacking the Elevator Pitch: Women’s Narratives in Engineering
Sarah Appelhans, University at Albany-SUNY

Engineering Students’ Views on the Effectiveness of Peer Tutors in Scholars Assisting Scholars Program
Dr. Yang Yang, Kansas State University
Dr. Bette Grauer PE, Kansas State University
Mrs. Jennifer Renee Thornburg, Kansas State University
Dr. Amy Rachel Betz, Kansas State University

The Impacts on Peer Tutors of Leading Group Supplemental Instruction for First-Year Engineering Students
Ms. Caroline Ghio, Northeastern University
Ms. Sydney Anne Morris, Northeastern University
Ms. Hannah Marie Boyce, Northeastern University
Mr. Bradley Joseph Priem, Northeastern University
Dr. Paul A. DiMilla, Northeastern University
Ms. Rachelle Reisberg, Northeastern University

Promoting an Inclusive Lab Culture through Custom In-Person Trainings within an Engineering Department
Lisa R. Volpatti, Department of Chemical Engineering, Massachusetts Institute of Technology
Kara Rodby, Department of Chemical Engineering, Massachusetts Institute of Technology
Gurleen Kaur Singh, Massachusetts Institute of Technology
Bianca Kaushal, Massachusetts Institute of Technology
Kelley Marie Adams, Massachusetts Institute of Technology
Prof. Paula T. Hammond, Department of Chemical Engineering, Massachusetts Institute of Technology
Ms. Sarah Rankin

Revising Roles: Enhancing an Engineering Capstone Course to Improve Outcomes for Women
Mary Kay Camarillo P.E., University of the Pacific
Dr. Eileen Kogl Camfield, University of California at Merced

R357 - Learnin’ Lessons about Faculty Development
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE

This session will highlight new and innovative elements of faculty development. Come learn some lessons from your fellow Faculty Developers!

ASME Early Career Leadership Intern Program to Serve Engineering (ECLIPSE): A Talent Pipeline Model for Developing Early Career Mechanical Engineers into Future Leaders

Dr. Khosro Shirvani, Farmingdale State College

Lessons Learned: Teaching and Learning Academy Workshop to Promote Asset-based Mindset among STEM Faculty

Dr. Daniel Galvan, California State University, Los Angeles
Dr. Jianyu "Jane" Dong, California State University, Los Angeles
Dr. Lizabeth T Schlemer P.E., California Polytechnic State University, San Luis Obispo
Dr. Emily L. Allen, California State University, Los Angeles

Lessons Learned about Fostering Curricular Change

Dr. Laura Ann Gelles, University of San Diego
Prof. Michelle M. Camacho, University of San Diego

The Benefits of Discipline-based Communities for Faculty Teaching Development

Dr. Margret Hjalmarson, George Mason University
Prof. Jill K. Nelson, George Mason University

R360 - FOCUS ON EXHIBITS: Virtual Showcase
12:00 P.M. - 1:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: ASEE Headquarters

Live interaction with sponsors and exhibitors.
R371A - NSF Grantees: First Year Programming (2)
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: NSF Grantees Session
Moderators: Amber Genau, University of Alabama at Birmingham; Robin Hensel, West Virginia University

Presentations from groups with current NSF-funded projects focused on engineering students during their first year of higher education, including summer bridge programs.

**Impacts Resulting from a Large-scale First-year Engineering and Computer Science Program on Students’ Successful Persistence Toward Degree Completion**
- Dr. Gisele Ragusa, University of Southern California
- Dr. Emily L. Allen, California State University, Los Angeles
- Prof. Gustavo B. Menezes, California State University, Los Angeles

**Longitudinal Memos Investigating First-year Engineering Pathways**
- Cassie Wallwey, Ohio State University
- Abigail Clark, Ohio State University
- Miss Soundous Sassi, Mississippi State University
- Katherine Elmore, Mississippi State University
- Dr. Rachel Louis Kafiez, Ohio State University
- Dr. Mahnas Jean Mohammadi-Aragh, Mississippi State University
- Anastasia Nicole Doty, Ohio State University

**Sustainable Bridges from Campus to Campus: Aggregate Results for Engineering Ahead Cohorts One to Three (#1525367)**
- Dr. Catherine L. Cohan, Pennsylvania State University, University Park
- Dr. Pradip K. Bandyopadhyay, Pennsylvania State University, Berks
- Dr. Ryan Scott Hassler, Penn State University, Berks
- Prof. Mark William Johnson, Pennsylvania State University, Altoona
- Dr. Michael Kagan, Pennsylvania State University, Abington
- Dr. Ann Marie Schmiedekamp
- Dr. Peter J. Shull, Pennsylvania State University, Altoona
- Dr. Peter J. Butler, Pennsylvania State University
- Dr. Tonya L. Peeples, Pennsylvania State University

**Engendering Community to Computer Science Freshmen through an Early Arrival Program**
- Prof. Alark Joshi, University of San Francisco
- Mr. Gian Bruno

R371B - NSF Grantees: Sustainability
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: NSF Grantees Session
Moderators: Amber Genau, University of Alabama at Birmingham; Sarah Bauer, Rowan University

Presentations from groups with current NSF-funded projects focused on curricula and research experiences related to issues of environmental sustainability.

**Incorporating Sustainability and Resiliency Content into the Civil Engineering Undergraduate Curriculum**
- Prof. Bhaskar Chittoori P.E., Boise State University
- Dr. Noah Salzman, Boise State University
- Dr. Robert Hamilton P.E., Boise State University
- Dr. Debakanta Mishra, Oklahoma State University
- Dr. Sondra M. Miller, Boise State University

**Design and Assessment of Architecture/Engineering/Construction (AEC) Curricula for Resilient and Sustainable Infrastructure**
- Dr. Carla Lopez del Puerto, University of Puerto Rico, Mayaguez Campus
- Prof. Humberto Eduardo Cavallin
- Prof. Oscar Marcelo Suarez, University of Puerto Rico, Mayaguez Campus
- Dr. Jonathan Munoz Barreto,
- Dr. Jose L. Perdomo, University of Puerto Rico
- Dr. Drianfel E. Vázquez, University of Puerto Rico, Ponce Campus
- Prof. Fabio Andrade Rengifo P.E., University of Puerto Rico, Mayaguez Campus
- Dr. Luisa Guillelma, University of Puerto Rico, Myagüez Campus
- Miss Ormari Troche

**Broadening Participation Research Project: Charting a Path to Transdisciplinary Collaborative Design**
- Prof. Mason Andrews, Hampton University
- Mujde Erten-Unal, Old Dominion University
- Ms. Carol L. Considine, Old Dominion University

**NRT-INFES: The DataFEWSion Traineeship Program for Innovations at the Nexus of Food Production, Renewable Energy, and Water Quality**
- Dr. Sarah M. Ryan, Iowa State University
ASEE’S VIRTUAL CONFERENCE
THURSDAY, JUNE 25 SESSIONS

#ASEEVC

R371C - NSF Grantees: Entrepreneurship
11:40 A.M. - 12:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: NSF Grantees Session
Moderators: Amber Genau, University of Alabama at Birmingham; Dominic Dal Bello, Allan Hancock College

Presentations from groups with current NSF-funded projects focused on entrepreneurship.

Impact of an I-Corps Site Program on Engineering Students at a Large Southwestern University: Year 3
Ms. Magdalini Z. Lagoudas, Texas A&M University
Dr. So Yoon Yoon, University of Cincinnati
Mr. Rodney Boehm, Texas A&M University
Miss Samantha Asbell, Texas A&M University

Promoting Innovation and Entrepreneurship Education in Physics: The PIPELINE Network
Dr. Crystal Bailey, American Physical Society

Fostering Entrepreneurial Mindset and Innovation in a Cross-Listed Science and Engineering Course
Dr. Bahram Roughani, Loyola University Maryland

R371D - NSF Grantees: First Year Programming (1)
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: NSF Grantees Session
Moderators: Amber Genau, University of Alabama at Birmingham; Marilyn Barger, National Science Foundation ATE Centers

Presentations from groups with current NSF-funded projects focused on engineering students during their first year of higher education.

Zip to Industry: A First-year Corporate-STEM Connection Program
Dr. Donald P. Visco Jr., University of Akron
Nidaa Makki, University of Akron
Dr. Linda M. Subich, University of Akron
Prof. David Steer, University of Akron
Ms. Erin R. Stevic, University of Akron

Results of a Pilot Effort with First-year Students
Mr. Brett Tallman P.E., Montana State University

Miss Tessa Sybesma, Montana State University
Dr. William J. Schell IV P.E., Montana State University
Dr. Bryce E. Hughes, Montana State University
Monika Kwapisz, Montana State University
Emma Annand, Montana State University
Shannon Ranch, Montana State University

R378 - Mental Health Revisited
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Undergraduate Experience Committee
Moderators: Ronald Welch, The Citadel; Jeffrey Ray, Western Carolina University
Speakers: Dr. Steven W McLaughlin, Georgia Institute of Technology; Dr. Jim A Nicell ing., McGill University; Dr. Alec Gallimore, University of Michigan

Call to Action with an Action Plan … Mobilize action across universities on this important issue. Mental health issues among students at the undergraduate and graduate levels is a much wider phenomenon than just what we observe in our home institutions. We can’t fix all the issues that lead to mental health crises among our youth. However, we must recognize that we, in our capacities as deans, department heads, and faculty, have a role to play in mental health and wellness. As a group, we need to focus on identifying the key pain points that contribute to mental health problems. We can work as a community to figure out various best strategies for how we might deal with specific issues that are within our scope of influence. Call on ASEE for a “Year of Wellness” theme!

R399 - SPONSOR TECHNICAL SESSION: Presented by the University of Maryland
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Sponsored Sessions
R399A - Sponsor Technical Session - Presented by STMicroelectronics

11:40 A.M. - 12:00 P.M., Online, A Virtual Conference
Sponsor: Sponsored Sessions

R399B - Sponsor Technical Session: Presented by IEEE

11:20 A.M. - 11:40 A.M., Online, A Virtual Conference
Sponsor: Sponsored Sessions

R402 - Architectural Engineering Division Business Meeting

2:00 P.M. - 3:00 P.M., Online, A Virtual Conference
Sponsor: Architectural Engineering Division

The Architectural Engineering Division will hold its annual business meeting to discuss topics focusing on the current and future ASEE Annual Conferences and on topics of importance to architecture, engineering and construction education, and industry. We will also conduct elections for division leadership positions. The meeting is open to all members of the Architectural Engineering Division of ASEE.

R404 - BME Design in the COVID-19 Era and How to Share Your Findings

2:00 P.M. - 3:00 P.M., Online, A Virtual Conference
Sponsor: Biomedical Engineering Division
Moderators: Rachael Schmedlen, University of Michigan; Aileen Huang-Saad, University of Michigan

Experts will lead an active discussion on best practices for teaching design courses in the current environment. This session will also present ideas on how to share research findings within the biomedical engineering education community.

R405 - CHED Business Meeting

2:00 P.M. - 3:00 P.M., Online, A Virtual Conference
Sponsor: Chemical Engineering Division

R409 - Construction Engineering Division Business Meeting

2:00 P.M. - 3:00 P.M., Online, A Virtual Conference
Sponsor: Construction Engineering Division

R411 - Joint Panel: Leveraging Experiential Education to Become an Engineering Education Leader

1:00 P.M. - 1:30 P.M., Online, A Virtual Conference
Sponsor: Cooperative and Experiential Education Division
Moderators: Mary Andrade, University of Louisville; Katherine McConnell, University of Colorado Boulder
Speakers: Dr. Amitava 'Babi' Mitra, Massachusetts Institute of Technology; Dr. Wael Mokhtar, Grand Valley State University; Prof. Anette Kolmos, Aalborg University

Given industry feedback and recent engineering accreditation changes, STEM educators have been driving curricular changes to better meet the needs of student populations and surrounding business communities. As a result, higher learning institutions, particularly in the STEM fields, have been implementing proactive and innovative steps to design and deliver a curriculum that is outcomes-based, provides discipline-specific knowledge, and is informed by real-world business needs and applications. This 30-minute interactive, joint panel session will be delivered in a live (synchronous) format. Speakers will give a brief presentation, followed by an opportunity for the panelists to respond to prompts. The session will conclude with the opportunity for attendees to discuss topics of interest with the individual speakers in a large group setting. The presentation will include topical coverage from three university perspectives: regional/comprehensive, research-based, and international.

Curriculum-Based Experiential Education Opportunities: This discussion will be targeted toward faculty or practitioners who are interested in learning about a wide range of hands-on, experiential learning opportunities throughout the curriculum that focus on “problem identification” as well as “problem solution.” These opportunities are typically supported by innovative maker spaces and team working areas, with assistance from longstanding industry partnerships.

Integration of Design Application throughout the Curriculum: This discussion will be targeted toward faculty and practitioners who are interested in integrating design applications throughout the curriculum, with mindfulness toward entrepreneurial ventures, social responsibilities, and a global skill set (skills to be effective in a global environment and to work across nationalities and cultures).

The following discussion points will be considered and addressed:

• What prompted your institution to implement this innovation in education?
• What are the specifics of the innovation—the name of the major/programmatic/class-based/institutional educational innovation as well as an articulation of the innovation itself?
• What was learned from this educational innovation (including what you would do differently)?
• What is the planned path ahead?
R423 - Engineering Technology Council
2:00 P.M. - 3:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsors: Engineering Technology Division; Engineering Technology Council
ETC Business Meeting

R424 - ENT Business Meeting
2:00 P.M. - 3:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Entrepreneurship & Engineering Innovation Division
Business meeting to discuss ENT Division matters, including program overview and election of officers.

R430 - Computing and Information Technology Business Meeting
2:00 P.M. - 3:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Computing and Information Technology Division
All interested members and guests of the CIT Division are invited to this annual meeting, at which next year's officers are elected.

R434 - LEES Division Business Meeting
2:00 P.M. - 3:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Liberal Education/Engineering & Society Division
LEES Business Meeting

R445 - Engineering Physics and Physics Panel Discussion Related to Accreditation
1:00 P.M. - 1:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Physics and Physics Division
Moderators: Bala Maheswaran, Northeastern University; Robert Ross, University of Detroit Mercy
Speakers: Dr. Baha Jassemnejad, ASRC Federal System Solutions, Federal Aviation Administration; Dr. Paul Benjamin Crilly, United States Coast Guard Academy; Dr. David K. Probst P.E., Greenville College; Dr. Steve H. Cobb P.E., Murray State University; Dr. Evan C. Lemley, University of Central Oklahoma
This session will provide valuable information for those interested in developing an ABET-accredited program. The expert panel consists of experienced ABET program evaluators who can help with answers to a wide variety of questions. It will benefit those with established programs as well as those just starting.

1:00 P.M. - 1:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Student Division
Moderator: Cassandra Woodcock, University of Michigan
Speakers: Dr. Courtney S. Smith-Orr, University of North Carolina at Charlotte; Dr. Cheryl A. Bodnar, Rowan University; Dr. Erin McCave, University of Houston
As the field continues to grow, more and more people are challenged with finding academic engineering education research (EER) positions that align with their broad abilities and interests. In the context of academia, EER positions most commonly exist in engineering education departments, traditional engineering departments (e.g., mechanical, civil), and non-degree granting programs (e.g., centers for teaching and learning, first-year engineering programs). These positions vary with regard to their emphasis on engineering education research, and provide access to different resources and mechanisms to impact engineering education.

This panel session is designed to help better understand the academic EER job market as it relates to what applicants (i.e., graduates and postdocs) experience as they navigate the academic job-search and decision-making process. During the sessions, panelists will (1) discuss what academic job opportunities existed for early-career engineering education researchers during the past 2.5 job-search cycles covering jobs posted to the ERM listserv from July 2017 through December 2019; (2) provide insight into the academic job search and decision-making process based on interviews conducted with seven early-career EER faculty members.

R451 - Computing -- Increasing Participation of Women and Underrepresented Minorities
1:00 P.M. - 1:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsors: Women in Engineering Division; Minorities in Engineering Division; Pre-College Engineering Education Division
Moderator: Laura Dillon, Michigan State University
Speakers: Prof. Linda Ott, Michigan Technological University; Prof. Wendy Powley, Queen’s University; Dr. Andrea E Johnson, Spelman College; Prof. Maureen Doyle, Ambitious national programs to increase diversity of the computing and information technology workforce are already well known in academic circles. Since 2013, Code.org has included 15 million young women.
Since 2006, AnitaB.org has offered annual Grace Hopper conferences featuring prominent women and people of color in computing and technology. Attendance at these conferences has grown to more than 25,000. Other organizations include the National Center for Women and Information Technology, the Association for Computing Machinery, the Computing Research Association, the Richard Tapia Conferences, Black Girls Code, and Girls Who Code.

In contrast, effective regional programs are less well known. Programs involving a half-dozen or more institutions and targeting narrower geographical regions can often be more cost effective than national ones, especially in engaging marginalized populations. This panel brings together four academic leaders to discuss their experiences in organizing and participating in regional programs to increase the meaningful participation of women and underrepresented minorities in computing. Panelists will address questions about goals, costs and benefits, building partnerships, lessons learned, and the impact on their careers from participating in these programs. Participants will come away with ideas for programs that may be effective in their regions. They will also receive pointers on building the necessary partnerships.

Panel Discussion on Regional Programs to Increase Participation of Women and Underrepresented Minorities in Computing: Experiences, Partnerships, and Lessons Learned
- Prof. Laura K. Dillon, Michigan State University
- Prof. Maureen Doyle, Northern Kentucky University
- Prof. Linda Ott, Michigan Technological University
- Prof. Wendy Powley, Queen’s University
- Dr. Andrea E. Johnson, Spelman College

R466A - INDUSTRY DAY: Hearing from Diverse Voices from the Classroom
1:00 P.M. - 1:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Corporate Member Council
Moderator: Cynthia Murphy, University of Texas at Austin
Hear from a diverse group of recent graduates to learn why they decided to change the world as engineering students. What does it mean to these new engineers to see diversity in the classroom and how can it help to drive innovation in the workplace?

Learn what educators, academic institutions, and industry need to do to nurture creativity in high school and maintain excitement throughout the college experience. Be a part of the discussion on increasing different perspectives in the global family of engineers and innovators.

R466B - Corporate Member Council - Board Meeting
2:00 P.M. - 3:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Corporate Member Council
All attendees from CMC member companies are welcome and encouraged to attend the annual board meeting. We would love to see more of you. We will be electing our new board members, reporting on the past year’s accomplishments, and planning our future activities.

R469 - Building a Research Scholarship Program
1:00 P.M. - 1:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Research Council
Moderator: Carrie Berger, Purdue University at West Lafayette
Speakers: Dr. Pamela Marie Norris, University of Virginia; Dr. Edward J. Berger, Purdue University at West Lafayette; Dr. Elliot P. Douglas, University of Florida
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, three invited panelists will make presentations addressing different aspects of this topic, including funding for educational research.
R477A - Equity and Inclusion Advocacy: Diversity, Equity & Inclusion 200

2:00 P.M. - 3:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: ASEE Commission on Diversity, Equity & Inclusion

Moderators: Jean Sanders, North Carolina State University at Raleigh; Jenna Carpenter, Campbell University; Meagan Pollock, Engineer Inclusion; Lynn Albers, Hofstra University; Andrea Havercamp, Oregon State University

Speakers: Mrs. Kayla R. Maxey, Purdue University at West Lafayette; Dr. Alisha L. Sarang-Sieminski, Franklin W. Olin College of Engineering

DEI 200: Diversity, equity, and inclusion starts with us, but individual awareness and action are not enough. In order to transform our institutions and organizations to be more diverse, equitable, and inclusive, we must understand the larger systems we construct, operate within, and sustain. In this session, we will introduce a systems-thinking framework through case-study analysis to assist us in identifying organizational successes and opportunities for improvement as we become catalysts for institutional change. We aim to raise the collective awareness of institutional biases to promote shared accountability to create equitable engineering education communities at every organizational level.

R479 - ABET Session: Making an Impact on STEM Education - Become an ABET Program Evaluator!

1:00 P.M. - 1:30 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: ABET Sponsored Sessions

Moderator: Tom Walker,

Speaker: Dr. Jennifer McFerran Brock, University of Alaska Anchorage

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 and confidence in technical education worldwide. These volunteer experts play a key role in ensuring that today’s college students are prepared to develop solutions that address some of the pressing sustainability challenges facing our planet. This session will provide important and timely information for prospective ABET Program Evaluators, including:

I) the impact of an ABET program evaluator on STEM education

II) an overview of ABET’s international growth and increasing need for program evaluators

III) the scope of program evaluator responsibilities

IV) requirements for service as an ABET program evaluator and an overview of the selection process

V) the program evaluator training process

R506 - Civil Engineering Division Planning Meeting

3:00 P.M. - 4:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Civil Engineering Division

Planning meeting to develop session ideas and draft the call for papers for the 2021 Annual Conference.

R507 - CIPD Business Meeting

3:00 P.M. - 4:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: College Industry Partnerships Division

Business meeting for anyone interested in CIPD.

R509 - Round Table 1 - COVID in the Spring

3:00 P.M. - 4:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Construction Engineering Division

Moderators: John Tingerthal, Northern Arizona University; Nicholas Tymvios, Bucknell University; Rachel Mosier, Oklahoma State University; Kimberly Talley, Texas State University

What happened in the spring of 2020? Discussion will include technologies used in the transition due to COVID-19.

R510 - CPDD Executive Board Meeting

3:00 P.M. - 4:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Continuing Professional Development Division

Business meeting of the Continuing Professional Development Division Executive Board

R517 - Engineering and Public Policy Division Business Meeting

3:00 P.M. - 4:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Engineering and Public Policy Division

Business meeting for Engineering and Public Policy Division. Open to all, even if you are not a current member of the division.

R523A - Engineering Technology Leadership Institute

3:00 P.M. - 4:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsors: Engineering Technology Division; Engineering Technology Council

ETLI business meeting and marketing discussion
The engineering education community includes educators, industry practitioners, and professional organizations working collaboratively to attract, recruit, and retain a diverse group of students in engineering who can strengthen the U.S. economy and benefit society. The National Science Foundation (NSF) supports this community through multiple programs that invest in leading-edge engineering education research that advances our understanding of teaching, learning, and institutional change in engineering education at the K-12 and college levels. NSF serves as a catalyst for divergent thinking, innovation, and collaboration among engineering faculty and practitioners, resulting in bold and innovative solutions to engineering education challenges. Determining where your research focus fits into this infrastructure can be a daunting task, especially for new engineering educators.

This mini-workshop will help direct new engineering educators toward the most appropriate opportunities available within the NSF. This session will include an overview of funding opportunities, with a focus on those in the Division of Undergraduate Education (DUE). Discussion of some of the common pitfalls will provide educators with insights that will aid them in their application process.
R604 - Diversity, Equity, and Inclusion in Biomedical Engineering: Best Practices and Future Directions
5:00 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Biomedical Engineering Division
Moderators: Brian Helmke, University of Virginia; Renata Ramos, Rice University
Speakers: Dr. Brian P. Helmke, University of Virginia; Dr. Michele J. Grimm, Michigan State University; Dr. Karin Jensen, University of Illinois at Urbana-Champaign; Dr. Rachel C. Childers, University of Oklahoma; Dr. Sara Schley, Rochester Institute of Technology

Experts will present the current state and best practices related to diversity, equity, and inclusion in BME programs, then lead an active discussion to support participants interested in enhancing their programs and to identify possible areas of collaboration and opportunities to drive educational research in this field.

R606 - Civil Engineering Division Business Meeting
5:00 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Civil Engineering Division

Annual business meeting of the Civil Engineering Division. Discussion and voting on issues facing the Division.

R609 - Round Table 2 - COVID-19 in the Fall
4:00 P.M. - 5:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Construction Engineering Division
Moderators: John Tingerthal, Northern Arizona University; Nicholas Tymvios, Bucknell University; Rachel Mosier, Oklahoma State University; Kimberly Talley, Texas State University

What will happen to our classes in the fall and how do faculty and universities expect to react?

R622 - CEMAL Meeting
4:00 P.M. - 5:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Management Division

Engineering Management Division - Council of Engineering Management Academic Leaders

R623 - ETD Business Meeting and Awards Luncheon
5:00 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Technology Division

Annual meeting for ETD membership, with division awards.

R625 - Environmental Engineering Division Business Meeting
4:00 P.M. - 5:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Environmental Engineering Division

Discuss Environmental Engineering Division current business, elect our new treasurer, and have input on the future direction of our division.

R627 - First-Year Programs Division Business Meeting
4:00 P.M. - 5:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: First-Year Programs Division

This is the First-Year Program Division (FPD) business meeting; all FPD members are encouraged to attend. Division business (e.g. elections) occurs during this session and opportunities to become more involved in the division are provided.

R635 - Manufacturing Division Business Meeting
5:00 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Manufacturing Division

Discussions about the next year and report on current business.

R637 - Mathematics Division Business Meeting
5:00 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Mathematics Division

Annual business meeting for members
R642A - Rx for Active Learning Success

5:00 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: New Engineering Educators Division

Moderators: Kerry Widder, Milwaukee School of Engineering; Derek Bried, Saint Vincent College

Speakers: Dr. Rebecca Brent, Education Designs, Inc; Dr. Richard M. Felder, North Carolina State University at Raleigh

Many engineering instructors have heard of active learning, but they're not really sure how to do it in their classes. Others think they know how to do it, but they often make mistakes that cause problems and are tempted to give up on it. In this highly interactive session, Drs. Rebecca Brent and Richard Felder will explore a variety of effective ways to get students actively engaged in engineering classes (both face-to-face and online) while minimizing those problems or avoiding them completely.

R642B - Pathways into Engineering Education Research: Where Do I Get Started?

4:00 P.M. - 5:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: New Engineering Educators Division

Moderators: Robert Schaffer, Mission College; Kerry Widder, Milwaukee School of Engineering

Speakers: Dr. Kelly J. Cross, University of Nevada, Reno; Dr. Karin Jensen, University of Illinois at Urbana-Champaign; Allyson Barlow, University of Nevada Reno

In this workshop, we will explore how engineering faculty can become involved in the engineering education research community. Engineering faculty bring an important perspective to engineering education research (EER), yet they rarely receive formal training or mentorship in EER or in approaches to implement research-based instructional strategies (RBIS). STEM faculty exploring teaching innovation have been linked to improved student development and outcomes, therefore it is important to understand how engineering faculty implement EER paradigms and practices to promote synergistic activities between these two communities that result in improved teaching and learning in engineering.

The practice of conducting EER by engineering faculty requires the acquisition of skills and knowledge, engagement in the community, and overcoming barriers of implementation. Some barriers include knowledge gaps in the scholarship of teaching and learning, engagement in the community, and overcoming barriers of implementation. Some barriers include knowledge gaps in the scholarship of teaching and learning, paradigm shifts in learning EER methods, and limited access to engineering education researchers. Restricted or inadequate interactions with experienced engineering education researchers can lead to less than the desired teaching and student outcomes. Overcoming these barriers and successfully training engineering faculty as engineering education researchers through direct mentorship will expand and diversify the engineering education research community.

Specifically, this workshop explores effective mentoring approaches that support the transition of engineering faculty into engineering education researchers by studying the direct mentor-mentee dynamics.

R656 - Military and Veterans Division Business Meeting

5:00 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Military and Veterans Division

R657 - Faculty Development Division Business Meeting

4:00 P.M. - 5:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Faculty Development Division

This is the awesome and exciting BUSINESS MEETING of the Faculty Development Division. Everyone is welcome!

R660A - Christian Faculty Meeting

5:00 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: ASEE Headquarters

Please join us for an encouraging talk from an engineering faculty member sharing about their faith within the university marketplace, followed by discussion and prayer. Faculty and students from all religious or nonreligious backgrounds are welcome.

R660B - EDC Data Committee Meeting

5:00 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: ASEE Headquarters

Business meeting of the EDC Data Committee to discuss modifications to Profiles plus issues related to COVID-19.

R668 - EDC Business Meeting

4:00 P.M. - 5:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Engineering Deans Council

Breakfast
R677 - Inclusive Practices for Implementing Collaborative Learning in Large Classes  
4:00 P.M. - 5:00 P.M., ONLINE, A VIRTUAL CONFERENCE  
Sponsor: ASEE Commission on Diversity, Equity & Inclusion  
Moderators: Federica Robinson-Bryant, Embry-Riddle Aeronautical University - Daytona Beach; Homero Murzi, Virginia Polytechnic Institute and State University  
Speaker: Dr. Brian P. Helmke, University of Virginia

As instructors of medium-to-large engineering courses (defined here as more than 50 students) move away from traditional lectures and toward evidence-based practices to support student learning, they face challenges associated with providing equitable access to learning activities. For example, students identifying with underrepresented groups, first-generation students, transfer students, women in a majority male class, and students with cognitive challenges may experience anxiety in group activities, impostor syndrome, or fear of approaching instructors for help. Students with physical challenges may be limited in their participation by modes of content delivery and physical setup or access in the classroom.

The overall goals of this workshop are to highlight challenges to successful classroom group-work activities presented by learner variability and to provide resources that support best practices for inclusive teaching in this setting. The workshop will be designed to model aspects of Universal Design for Learning (UDL) (Burgstahler, 2015; Moore, 2007). Participants will experience inclusive practices during the workshop activities. Workshop activities will include collaborative learning, interactive lecture, and a case study. The workshop facilitator has previously led workshops on group work in large courses (Helmke, 2019) and on inclusive teaching practices (Benkeser, 2019).

The workshop leader will demonstrate inclusive practices. Handouts will include prompts for workshop group activities, a list of collaborative learning techniques, reflection questions to support designing a group activity for participants’ classes, and a list of references and additional resources to support continued learning. Slides will incorporate UDL principles. The facilitator will use a microphone and will record the workshop session in case some participants cannot fully participate live. The recording will be transcribed and/or captioned using software available at the facilitator’s home institution.

R677B - CDEI Round Table Conversations on Diversity, Equity, and Inclusion  
5:00 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE  
Sponsor: ASEE Commission on Diversity, Equity & Inclusion  
Moderators: Susan Walden, University of Oklahoma; Elizabeth Litzler, University of Washington; Rebeca Bates, Minnesota State University, Mankato  
Speakers: Dr. Susan E. Walden, University of Oklahoma; Dr. Elizabeth Litzler, University of Washington; Prof. Rebecca A. Bates, Minnesota State University, Mankato

A popular session that has become a CDEI tradition, the CDEI Round Table includes conversations on a variety of topics or issues on the minds of participants. The moderator will lead a structured idea generation period, then instruct participants to move to the conversation that interests them most. Each conversation group reports to the whole group the highlights or suggested solutions that arose.

R678 - UEC: Undergraduate Experience Committee Business Meeting  
4:00 P.M. - 5:00 P.M., ONLINE, A VIRTUAL CONFERENCE  
Sponsor: Undergraduate Experience Committee  
UEC Business Meeting  
Organizers: Dr. Jerome Lavelle, Associate Dean, North Carolina State University; Dr. Jenna Carpenter, Dean, Campbell University

R711 - ASEE-CEED Social  
4:30 P.M. - 5:00 P.M., ONLINE, A VIRTUAL CONFERENCE  
Sponsor: Cooperative and Experiential Education Division  
Get to know your fellow Cooperative and Experiential Education Division (CEED) members at our evening social. This event will be available to all CEED members and invited guests.

R716 - Social: Energy Conversion & Conservation Division and Manufacturing Division  
7:00 P.M. - 9:00 P.M., ONLINE, A VIRTUAL CONFERENCE, TBA  
Sponsors: Energy Conversion and Conservation Division; Manufacturing Division  
This year, our dinner event will be online. We can talk to each other while each of us enjoys a meal.

This social event, hosted jointly by the Energy Conversion and
Conservation and Manufacturing divisions, provides an opportunity for members of these two divisions to talk about Green Energy Manufacturing and Energy Saving in Manufacturing. We also encourage the members of other divisions to join us if interested.

**R724 - ENT Reception and Award Ceremony**
7:00 P.M. - 9:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Entrepreneurship & Engineering Innovation Division
Division social with poster presentations and awards for best paper.

**R725 - Environmental Engineering Division Social**
5:00 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Environmental Engineering Division
Division Social

**R727 - First-year Programs Division Social**
7:00 P.M. - 9:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: First-Year Programs Division
Join the First-year Programs Division members for a virtual social. This is an excellent time to meet other members of the FPD community! We will present our division awards, including Best Paper, Best Presentation from the 2019 Conference, and the FPD Distinguished Service Award.

**R729 - Joint Divisions Social Event**
7:00 P.M. - 9:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsors: Industrial Engineering Division; Engineering Economy Division; Engineering Management Division; Systems Engineering Division
Social and awards ceremony for the Industrial Engineering Division, Engineering Economy Division, Engineering Management Division, and Systems Engineering Division.

**R732 - International Division Social Event**
7:00 P.M. - 9:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: International Division
The International Division invites all members of the division and those interested in becoming a member to a social gathering.

**R734 - LEES Social Event**
7:00 P.M. - 9:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Liberal Education/Engineering & Society Division
Informal social gathering for members and friends of LEES.

**R739 - Mechanics Division Virtual Awards Banquet**
7:00 P.M. - 9:00 P.M., ONLINE, A VIRTUAL CONFERENCE, TBD
Sponsor: Mechanics Division
Members of the Mechanics Division and guests are invited to attend this online event, where we grab our favorite meal and drink, join other colleagues next to our computer screens, and enjoy our very first virtual awards banquet.

**R740 - PCEE/MIND/WIED Mixer**
7:00 P.M. - 9:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsors: Minorities in Engineering Division; Pre-College Engineering Education Division
Join the Minorities in Engineering Division, Pre-College Engineering Education Division, and Women in Engineering Division for our annual social mixer.

**R742 - NEE Division Networking Social**
7:00 P.M. - 9:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: New Engineering Educators Division
An opportunity to network with other new engineering educators, learn from other's experiences, and identify potential collaborators for future projects. Please join us if you would like to get involved!
F205A - Work in Progress: Hands-on Activities
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Chemical Engineering Division
Moderators: Michael Barankin, Colorado School of Mines; Erin Jablonski, Bucknell University
Faculty Feedback on Hub-based Approach to National Dissemination of Low-cost Desktop Learning Modules
Katelyn Dahlke, Washington State University
Prof. Bernard J. Van Wie, Washington State University
Jacqueline Burgher Gartner, Campbell University
Dr. Olusola Adesope, Washington State University
Dr. Prashanta Dutta, Washington State University
David B. Thiessen, Washington State University
Work in Progress: Kinesthetic Learning of Network Mechanics Using Force Feedback Technology
Dr. Ilhem F. Hakem, Carnegie Mellon University
Mr. Richard Tang, Carnegie Mellon University
Dr. Michael R. Bockstaller, Carnegie Mellon University
Design Philosophy and System Integrity for Propagation of Hands-on Desktop Learning Modules for Fluid Mechanics and Heat Transfer
Negar Beheshti Pour, University of California - Berkeley
David B. Thiessen, Washington State University
Prof. Bernard J. Van Wie, Washington State University
Kitana Kaiphanliam, Washington State University
Aminul Islam Khan P.E., Washington State University
Dr. Prashanta Dutta, Washington State University
Mrs. Olivia Reynolds, Washington State University
Katelyn Dahlke, University of Wisconsin - Madison
Prof. Olusola Adesope, Washington State University
Olufunso Oje, Washington State University
Jacqueline Burgher Gartner, Campbell University
Work in Progress: Hands-on Learning Devices for Exposure to Biomedical Applications within Chemical Engineering
Kitana Kaiphanliam, Washington State University
Mrs. Olivia Reynolds, Washington State University
David B. Thiessen, Washington State University
Dr. Olusola Adesope, Washington State University
Prof. Bernard J. Van Wie, Washington State University

F206 - High-impact Learning Practices
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Civil Engineering Division
Moderator: Charles Riley, Oregon Institute of Technology
This session includes papers describing high-impact learning practices (HILP), including internships, undergraduate research, and competitions.
Implementation of a Civil Engineering High-impact Learning Practice (HILP) Requirement in Support of ASCE Body of Knowledge (BOK) Outcomes
Dr. Kelly Brumbelow, Texas A&M University
Dr. Luciana R. Barroso, Texas A&M University
Greg Stadler, Texas A&M University
Analyzing the Effectiveness of Competition and Interdisciplinary Teams in Student Learning
Col. Aaron T. Hill Jr., United States Military Academy
Lt. Col. Kevin P. Arnett P.E., United States Military Academy
Cosme Alejandro Lopez Jr.
Mr. James Anthony Baglino, United States Military Academy
Mr. Nicholas Perovich, United States Military Academy
Adriel Evan Moran
Adam Thomas Hebert, United States Military Academy
Anthony Bradley, United States Military Academy
The Impact of Internships on Civil Engineering Students’ Exploration of Learning Styles
Hwangbo Bae, University of Florida
Dr. Madeline Polmear, University of Florida
Dr. Denise Rutledge Simmons P.E., University of Florida
Effective Methods to Promote Undergraduate Research in Civil Engineering
Prof. Jieun Hur P.E., Ohio State University
Prof. Nathan Hyungskook Choe, Ohio State University

F208 - Computers in Education Division Technical Session 8: Modulus Topics
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Computers in Education Division
Moderators: Enrique Alvarez Vazquez, North Dakota State University; Ashkan Negahban, Pennsylvania State University
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.
F211 - Cooperative and Experiential Education Division Technical Session 3 - Co-op Recruitment and Factors Affecting Success

10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Cooperative and Experiential Education Division
Moderators: Mary Andrade, University of Louisville; Katherine McConnell, University of Colorado Boulder

This session will provide a best-practices overview of co-op recruitment and factors that affect success. This live (synchronous delivery) session will include a brief overview from each presenter, followed by an interactive question-and-answer session that allows for focused audience engagement. Before participating in this session, it is advised that the online technical session content (pre-recorded, asynchronous delivery) be reviewed.

Free ticketed event

Guiding Student Engineers in the Co-op Obtainment Process: Exploring Methods of Motivation
Ms. Brandy Maki, Minnesota State University, Mankato
Cody Mann, Minnesota State University, Mankato

Design-Based Research: Students Seeking Co-op in New Educational Model
Dr. Dennis Rogalsky, Minnesota State University, Mankato
Dr. Bart M. Johnson, Itasca Community College
Dr. Ronald R. Ulseth, Iron Range Engineering

A Design-Thinking Approach to Increasing Student Efficacy in the Internship Search Process
Dr. Katherine McConnell, University of Colorado Boulder

Learning to Talk the Talk – Preparing Students for Success during Internships through Communication Workshops

Dr. Sarah A. Wilson, University of Kentucky
Dr. Renee Kaufmann, University of Kentucky

Exploring how Innovation Self-efficacy Measures Relate to Engineering Internship Motivations and Outcomes
Amy Huynh, University of California, Irvine
Dr. Helen L. Chen, Stanford University
Dr. Krishnaswamy Venkatesh Prasad, Ford Motor Company
Dr. Sheri Sheppard, Stanford University

F214A - Engineering Education Research Practices and Community
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Educational Research and Methods Division
Moderators: James Pembridge, Embry-Riddle Aeronautical University - Daytona Beach; Gwen Lee-Thomas, Quality Measures

Impact of the Emerging Engineering Education Research and Innovation Community
Dr. Audeen W. Fentiman, Purdue University, West Lafayette
Dr. Donna M. Riley, Purdue University, West Lafayette
Dr. Elizabeth Litzler, University of Washington
Dr. Jeremi S. London, Virginia Polytechnic Institute and State University
Dr. Julia M. Williams, Rose-Hulman Institute of Technology
Dr. Jennifer M. Case, Virginia Polytechnic Institute and State University

Understanding How Novice Indian Faculty Engage in Engineering Education Research
Mr. Javeed Kittur, Arizona State University
Dr. Brooke Charae Coley, Arizona State University
Dr. Nadia N. Kellam, Arizona State University

Developing an Instrument to Measure Engineering Education Research Self-efficacy
Javeed Kittur, Arizona State University
Dr. Samantha Ruth Brunhaver, Arizona State University

Measuring Links Between Awareness and Implementation of Engineering Education Research in Practice
Ms. Samantha N. Cruz, Arizona State University
Dr. Jeremi S. London, Virginia Polytechnic Institute and State University
Ms. Taylor Lightner, Virginia Polytechnic Institute and State University

Schedule subject to change. Please go to www.asee20.pathable.co for up-to-date information.
ASEE'S VIRTUAL CONFERENCE
FRIDAY, JUNE 26 SESSIONS
#ASEEVC

F214B - Graduate Education Expectations, Preparation, and Pathways
10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Educational Research and Methods Division
Moderators: Margo Cousins, University of Texas at Austin; James Pembridge, Embry-Riddle Aeronautical University - Daytona Beach

Projections as Preparation for Persistence: Exploring Expectations for Engineering Graduate School
Ellen Zerbe, Pennsylvania State University
Gabriella M. Sallai, Pennsylvania State University
Dr. Catherine G.P. Berdanier, Pennsylvania State University

Nonacademic Career Pathways for Engineering Doctoral Students: An Evaluation of an NSF Research Traineeship Program
Ms. Maya Denton, University of Texas at Austin
Dr. Maura Borrego, University of Texas at Austin
Dr. Chi-Ning Chang, University of Kansas
Dr. Audrey Boklage, University of Texas at Austin
Dr. Raymundo Arroyave, Texas A&M University

Optimal Sequencing of Graduate Funding in a Chemical Engineering Department: Maximizing Completion and Persistence Rates
Ms. Maya Denton, University of Texas at Austin
Dr. Nathan Hyungsok Choe, Ohio State University
Dr. Maura Borrego, University of Texas at Austin
Dr. David B. Knight, Virginia Polytechnic Institute and State University

Examining Pathways into Graduate School through Stewardship Theory
Mr. Kanembe Shanachilubwa, Pennsylvania State University
Dr. Catherine G.P. Berdanier, Pennsylvania State University

F214C - Perspectives and Evaluation of Engineering Design Education
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Educational Research and Methods Division
Moderators: Linjue Wang, Ohio State University; James Pembridge, Embry-Riddle Aeronautical University - Daytona Beach

Characterizing Students' Design Strategies During Simulation-based Engineering of Sustainable Buildings
Dr. Tugba Karabiyik, Purdue University, West Lafayette

Dr. Alejandra J. Magana, Purdue University, West Lafayette
Dr. Paul Parsons, Purdue University, West Lafayette
Ms. Ying Ying Seah, Purdue University, West Lafayette

A Service-oriented Learning Approach for the Electrical Engineering Capstone Design Course
Dr. Radian G. Belu, Southern University and A&M College
Prof. Lucian Ionel Cioca, Lucian Blaga University of Sibiu
Dr. Fred Lacy, Southern University and A&M College

Evaluating the Impacts of Community Service on Student Learning Outcomes
Dr. Jennifer Lyn Benning, Virginia Tech
Miss Alexis J. Long, South Dakota School of Mines and Technology
Dr. Stuart D. Kellogg, South Dakota School of Mines and Technology
Dr. William "Bill" C. Oakes, Purdue University, West Lafayette

Developing Contextual Social Awareness in Engineering: Placing Human Diversity and Social Justice at the Center of the Engineering Process
Mrs. Greses Pérez, Stanford University
Mr. Patrick Marcel Danner, Technical University of Munich
Dr. Shannon Katherine Gilmartin, Stanford University
Dr. Carol B. Muller, Stanford University
Dr. Sheri Sheppard, Stanford University

Solution Diversity in Engineering Computing Final Projects
Ms. Sara Willner-Giwerc, Tufts University
Dr. Kristen B. Wendell, Tufts University
Prof. Chris Buergin Rogers, Tufts University
Dr. Ethan E. Danahy, Tufts University
Isabella Stuopis, Tufts University

Work in Progress: Veterinary Medicine as a Context for Student Reasoning in a Mechanical Engineering Capstone Design Course
Isabella Stuopis, Tufts University
Dr. Kristen B. Wendell, Tufts University
Dr. Melissa R. Mazan, Tufts University
F215 - New ECE Laboratories
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Electrical and Computer Division
Moderators: Jennifer Bonniwell, Milwaukee School of Engineering; Huihui Wang, Jacksonville University

Effectiveness of Using MyFPGA Platform for Teaching Digital Logic
Dr. Junfei Li P.E., University of Texas Rio Grande Valley
Cara Li
Dr. Jae Sok Son, University of Texas Rio Grande Valley
Dr. Weidong Kuang, University of Texas Rio Grande Valley
Mr. Edgar Gil, University of Texas Rio Grande Valley

Experience of IoT Transceiver with Affordable Software-defined Radio Platform
Dr. Liang Hong, Tennessee State University

Development of a Printed Circuit Board Design Laboratory Course
Dr. Pelin Kurtay, George Mason University

Designing Introductory, Hands-on, Open Source Power Electronics Lab Exercises
Mr. Mark William Thoren, Analog Devices Inc.
Dr. Taufik, California Polytechnic State University, San Luis Obispo

F216 - ECCD - Technical Session 6
- Energy & Thermodynamics
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Energy Conversion and Conservation Division
Moderators: Lynn Albers, Hofstra University; Maryam Younessi Sinaki

Papers presented in this session are related to energy and thermodynamics and their educational aspects.

Free ticketed event

BITES and TEST Web Tools to Enhance an Undergraduate Thermodynamics Course
Dr. Abhijit Nagchaudhuri, University of Maryland, Eastern Shore

Integration of Service Learning to Teaching Thermodynamics
Dr. Farshid Zabihian, California State University, Sacramento

Teaching Thermodynamics Online: Instructor and Student Perspectives
Dr. Farshid Zabihian, California State University, Sacramento

Graded Homework vs. Quizzes on Homework Material: Impacts on Student Performance in a Thermodynamics Course
Major Steven Hoak, United States Military Academy

F218 - Engineering Design Graphics Division Technical Session 5
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Design Graphics Division
Moderator: Yaël-Alexandra Monereau, University of South Florida

Extending bridges between design graphics and engineering technology.

Forming a Strong Association Between Dimensional Data in Sketches and Engineering Drawings
Dr. Theodore J. Branoff, Illinois State University
Dr. Kevin L. Devine, Illinois State University

Students’ Understanding of Datum Reference Frame Concepts in a GD&T Course: Student Outcomes Across Multiple Semesters
Dr. Robert A. Chin, East Carolina University
Dr. Ranjeet Agarwala, East Carolina University

F222 - Engineering Management Division 4: Teaching and Learning in Engineering Management
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Management Division
Moderator: Christopher Rowe, Vanderbilt University

The second of two sessions includes papers related to curricular, classroom, and teaching improvements and innovations.

An Innovative Project-based Learning Approach to Teach Project Management
Dr. Yi-hsiang Isaac Chang, Illinois State University
Dr. Dave Yearwood, University of North Dakota

An Integrated Platform of Active Learning Techniques in a Supply Chain Management Program
Dr. Jena Shafai Asgarpoor, University of Nebraska - Lincoln

Applying Systems Engineering Tools to Model a Food Justice System in an Engineering Management Course
Dr. Sandra L. Furterer, University of Dayton

A Study of the Effectiveness of Using Hands-on Active Learning Exercises in a Production Operations Management Course
Major Steven Hoak, United States Military Academy

Dr. John R. Reisel, University of Wisconsin, Milwaukee
F223A - ET Pedagogy III
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Technology Division
Moderator: Kevin Cook, Montana State University - Bozeman

How Extra Credit Quizzes and Test Corrections Improve Student Learning While Reducing Stress
Dr. Brian Scott Rice, Rochester Institute of Technology

Impact of Pre-lab Videos on Improving Students’ Learning Outcomes
Ms. Resmi KrishnankuttyRema, Bowling Green State University
Mr. Mikhail Shilov, Bowling Green State University

Moving an Agenda of Active Learning in Engineering Forward through a Model of Distributed Expertise
Dr. Sonia Travaglini, Stanford University
Dr. Sheri Sheppard, Stanford University
Dr. Helen L. Chen, Stanford University

Profile of Motivation in Project-based Robotics Experience
Dr. John R. Haughery, Iowa State University

Testing Students’ Knowledge Gain in an Active Learning “Lab-similar” Environment through Pre- and Post-lab Questionnaires
Dr. Maher Shehadi, Purdue University

F223B - STEM Issues in ET II
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Technology Division
Moderator: Anne Lucietto, Purdue Polytechnic Institute

Purdue Mission to Mars 2.0: A Learn-by-Doing Approach to Recruiting
Dr. Rustin Webster, Purdue University, New Albany
Dr. Matthew Turner, Purdue University, New Albany

Math Anxiety: Engineering Technology Students’ Problem Solving through Rational or Experiential Contexts
Dr. Anne M. Lucietto, Purdue University, West Lafayette
Miss Meher Rusi Taleyarkhan, Purdue University, West Lafayette
Dr. Natalie Hobson, Sonoma State University
Therese M. Azevedo, Sonoma State University

Math Anxiety in Female and Underrepresented Minority Students: A Literature Review
Dr. Anne M. Lucietto, Purdue Polytechnic Institute
Miss Meher Rusi Taleyarkhan, Purdue Polytechnic Institute
Therese M. Azevedo, Sonoma State University

Dr. Natalie Hobson, Sonoma State University
Sensing and Measuring the Environment Workshop as Exposure to Engineering Technology for High School Students in a Summer Residential Camp
Dr. Vukica M. Jovanovic, Old Dominion University
Dr. Otilia Popescu, Old Dominion University
Dr. Murat Kuzlu, Old Dominion University
Mujde Erten-Unal, Old Dominion University
Prof. Balša Terzić, Old Dominion University
George McLeod, Old Dominion University
Dr. Tysha Batts, Virginia Space Grant Consortium
Dr. Cynthia Tomovic, Old Dominion University

Dr. Anne M. Lucietto, Purdue Polytechnic Institute
Miss Meher Rusi Taleyarkhan, Purdue Polytechnic Institute
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Prof. Balša Terzić, Old Dominion University
George McLeod, Old Dominion University
Dr. Tysha Batts, Virginia Space Grant Consortium
Dr. Cynthia Tomovic, Old Dominion University

F224 - ENT Division Technical Session: EM Across the Curriculum II
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Entrepreneurship & Engineering Innovation Division
Moderator: Jason Forsyth, James Madison University

A Vertically Integrated Portfolio Process to Foster Entrepreneurial Mindset Within an Undergraduate Biomedical Engineering Curriculum
Dr. Cristi L. Bell-Huff, Georgia Institute of Technology
Dr. Kali Lynn Morgan, Georgia Institute of Technology
Dr. Paul Benkeser, Georgia Institute of Technology
Prof. Joseph M. LeDoux, Georgia Institute of Technology

An Entrepreneurially Minded Learning (EML) Module Involving Global Markets for Medical Devices Implemented in an Engineering Physiology Course
Dr. Michael J. Rust, Western New England University

Work in Progress: Entrepreneurially Minded Learning in a Physiological Signals Analysis Lab
Jennifer Bailey, Rochester Institute of Technology
Dr. Michael Scott Richards

Work in Progress: Integrating the Entrepreneurial Mindset into a Software Requirements Course
Dr. Walter W. Schilling Jr., Milwaukee School of Engineering

Using the Entrepreneurial Mindset to Master Kinematics and Human Body Motion in a Biomechanics Course
Dr. Andrea T. Kwaczala, Western New England University
F227A - First-year Programs: Cornucopia #1
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: First-Year Programs Division
Moderators: John Burkhardt, United States Naval Academy; Haritha Malladi, Lafayette College

Explore a wide range of topics related to first-year programs. There’s a taste of everything!

Fourth Time Around: Do Classes Get Better with Instructor Repetition?
- Dr. Joshua L. Hertz, Northeastern University
- Dr. Richard Whalen, Northeastern University
- Prof. Constantine Mukasa, Northeastern University
- Dr. John Sangster P.E., Northeastern University

Work in Progress: An Evaluation of a First-year Chemical Engineering Module on Students’ Curiosity and Connectivity
- Dr. Julianne Vernon, Vanderbilt University
- Mr. Yin Huang, Vanderbilt University

Work in Progress: Incorporating Sustainable Development Fundamentals in the First-year Engineering Program
- Dr. Jorge R. Lara, Texas A&M University
- Dr. Mark Weichold, Texas A&M University
- Prof. Patrick Linke, Texas A&M University at Qatar

Work in Progress: A Holistic Approach to the First-year Engineering Experience
- Mr. Kevin J. Lindsay, University of North Carolina at Charlotte
- Mrs. Meg Harkins, University of North Carolina at Charlotte
- Dr. Rachael Ohu, University of North Carolina at Charlotte
- Mr. Sherman Mumford, University of North Carolina at Charlotte
- Mrs. Linda A. Thurman, University of North Carolina at Charlotte

Choose Your Own Adventure: Introducing Student Choice into a First-year Experience Course
- Stacie Edington, University of Michigan
- Dr. Claudia G. Cameratti-Baeza, University of Michigan
- Raven Knudsen, Kennesaw State University
- Dr. Frank J. Marsik, University of Michigan

F227B - First-Year Programs: Cornucopia #2
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: First-Year Programs Division
Moderators: Michelle Jarvie-Eggart, Michigan Technological University; Jaskirat Sodhi, New Jersey Institute of Technology

Explore a wide range of topics related to First-Year Programs. There’s a taste of everything!

The Impact of Depression on Academic Success and Academic Help-Seeking Attitudes
- Dr. Mary E. Goodwin, University of South Florida

Work in Progress: Parsons Problems as a Tool in the First-Year Engineering Classroom
- Brooke C. Morin, Ohio State University
- Dr. Krista M. Kecskemety, Ohio State University
- Dr. Kathleen A. Harper, Ohio State University
- Mr. Paul Alan Clingan, Ohio State University

Work in Progress: Students Find Active Learning Beneficial in Intro Programming Course
- Dr. Tonya Whitehead, Wayne State University

ACT Preparation and the Percent of Variability in First-Year Engineering Student GPA Explained by ACT Scores
- Ms. Teresa Lee Tinnell, University of Louisville
- Dr. Nora Honken, University of Cincinnati
- Dr. Patricia A. Ralston, University of Louisville

Work in Progress: Transitioning to Two Semesters: The Development of a Full-Year Cornerstone
- Ms. Uma Lakshman, NYU’s Tandon School of Engineering
- Dr. Jack Bringardner, NYU’s Tandon School of Engineering

F232 - International STEM Education: International Division Technical Session 6
10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: International Division
Moderator: Sanjeev Adhikari, Kennesaw State University

This session contains papers on STEM education in South America and Africa.

Changing Third-world Lives Through STEM Education in Honduras
- Dr. Sanjeev Adhikari, Kennesaw State University

Project Drawdown
- Dr. Rachel A. Brennan, Pennsylvania State University, University Park
Prof. Julio Urbina, Pennsylvania State University, University Park
Prof. Jose F. Oliden, Universidad Nacional de Ingeniería
Prof. Juan Martín Rodríguez, Universidad Nacional de Ingeniería

Systematic Approach to Diversifying Botswana’s STEM Population
Dr. Cameron Denson, North Carolina State University
Dr. Tamecia R. Jones, North Carolina State University

## F233A - Pre-college Engineering Education Division Technical Session 13

### 10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE

**Sponsor:** Pre-College Engineering Education Division

**Moderator:** Jorge Kurita, Universidad Nacional de Asuncion

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**Computer Coding Scavenger Hunt Using Quick Response Codes (Resource Exchange)**
Dr. Stephany Coffman-Wolph, Ohio Northern University
Dr. Kimberlyn Gray, West Virginia University Institute of Technology

**Engaging High School Students in Building Prefabrication (Resource Exchange)**
Luciana Debs, Purdue University, West Lafayette
Dr. Yunfeng Chen, Purdue University, West Lafayette
Prof. Jiansong Zhang

**Enhancing STEM Education: Learning About Biomedical Engineering with 3-D Pens (Resource Exchange)**
Dr. Perihan Fidan, Tennessee Tech University
Dr. Stephanie L. Wendt, Tennessee Tech University
Dr. Jeremy Wendt, Tennessee Tech University
Dr. Ismail Fidan, Tennessee Tech University

**Make Way for Trains: A Community-connected Elementary Geotechnical Engineering Unit (Resource Exchange)**
Dr. Chelsea J. Andrews, Tufts University
Nicole Alexandra Batrouni, Tufts University
Dr. Kristen B. Wendell, Tufts University
Dr. Tejaswini S. Dalvi, University of Massachusetts, Boston

**Reservoir Rescue: A Community-connected Elementary Water Filtration Engineering Unit (Resource Exchange)**
Dr. Chelsea J. Andrews, Tufts University
Nicole Alexandra Batrouni, Tufts University
Dr. Kristen B. Wendell, Tufts University
Dr. Tejaswini S. Dalvi, University of Massachusetts, Boston

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**F233B - Pre-college Engineering Education Division Technical Session 14**

### 10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE

**Sponsor:** Pre-College Engineering Education Division

**Moderator:** Marcelo Caplan, Columbia College

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**Rosie Revere, Engineer Ecobrick Challenge, Student-Developed Lesson Plan (Resource Exchange)**
Ms. Krista Schumacher, University of St. Thomas

**Teaching Concepts of ‘Scale-up’ from Chemistry to Chemical Engineering Using Process Flow Diagrams (Resource Exchange)**
D’Andre Jermaine Wilson-Ihejirika P.Eng., BrainSTEM Alliance

D’Andre Jermaine Wilson-Ihejirika P.Eng., BrainSTEM Alliance

**Code + Chords: Engaging with Coding, Music, Art, and Technology (Resource Exchange)**
Alyssa Marie Eggersgluss, Playful Learning Lab
Dr. AnnMarie Thomas, University of St. Thomas
Dr. Deborah Besser P.E., University of St. Thomas
Dr. Jeff Jalkio, University of St. Thomas
Mr. Cullen Charles Kittams, University of St. Thomas
Grace Kubista

**K-12 Engineering and the Next Generation Science Standards: A Network Visualization and Analysis (Resource Exchange)**
René F. Reitsma, Oregon State University
Mr. Brian Gordon Hoglund, Oregon State University
Ms. Dua Chaker, University of Colorado, Boulder
Ms. Andrea Marks, Oregon State University
Dr. Michael Soltys, University of Colorado, Boulder

**Work. Study. Play!**
James R. McCusker, Wentworth Institute of Technology
Mr. Alex Spiro Burch
Ms. Jasmine Maya Andrade, Wentworth Institute of Technology

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Schedule subject to change. Please go to www.asee20.pathable.co for up-to-date information.
**F234 - Sustainability and Social Responsibility**

10:20 A.M. - 10:40 A.M., ONLINE, A VIRTUAL CONFERENCE

**Sponsor:** Liberal Education/Engineering & Society Division

**Moderator:** Sean Ferguson, University of Virginia

**Counteracting the Social Responsibility Slump? Assessing Changes in Student Knowledge and Attitudes in Mining, Petroleum, and Electrical Engineering**

- Dr. Jessica Mary Smith, Colorado School of Mines
- Dr. Greg Rulifson P.E., Colorado School of Mines
- Courtney Paige Stanton
- Dr. Carrie J. McClelland P.E., Colorado School of Mines
- Emily Sarver
- Dr. Linda A. Battalora, Colorado School of Mines
- Dr. Stephanie Claussen, Colorado School of Mines
- Dr. Susan K. Peterson, Marietta College
- Dr. Nicole M. Smith, Colorado School of Mines
- Dr. Elizabeth Holley
- Dr. Rennie B. Kaunda, Colorado School of Mines

**Engineering for People and Planet: A Multidisciplinary Course Proposal for Engineers on the UN Sustainable Development Goals**

- Ms. Jessica Taylor, Iowa State University
- Dr. Rebekah Oulton P.E., California Polytechnic State University, San Luis Obispo

**Designing for a Sustainable World: Integrating the United Nations Sustainable Development Goals into a First-year Engineering Course in Science, Technology, and Society**

- Dr. Benjamin J. Laugelli, University of Virginia

**F247 - Student Division Technical Session 3**

10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE

**Sponsor:** Student Division

**Moderator:** Adrianne Wheeler, Project SYNCERE

**When Teams Misunderstand: Ambiguous Language and Teamwork**

- Ms. Elizabeth Ann Strehl, University of Michigan
- Dr. Robin Fowler, University of Michigan

**Predicting Team Project Score: It's More about Team Harmony and Less about Individual Performance**

- Mr. Jeong Hin Chin, University of Michigan
- Mr. Yuan Gao, University of Michigan
- Herbert Li, University of Michigan

**F252 - Community Engagement Division Technical Session 3**

10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE

**Sponsor:** Community Engagement Division

**Moderators:** Juan Lucena, Colorado School of Mines; James Huff, Harding University

**Building Engaged Engineering in Curriculum - A Review of Brazilian and Australian Cases**

- Prof. John Bernhard Kleba, ITA - Aeronautics Technological Institute (Brazil)
- Dr. Cristiano Cordeiro Cruz, Aeronautics Technological Institute (Brazil)

**Can Community Development Projects in Engineering Education Be Both Responsible and Sustainable?: Theory, Education, and Praxis**

- Dr. Robert M. Brooks, Temple University
- Mr. Sangram Shinde, Department of Mechanical Engineering, Jazan University, Jazan KSA
- Hamza Alayyadah

**Parents’ Perceptions of STEM Education in Black Churches**

- Dr. Whitney Gaskins, University of Cincinnati
- Dr. Tracy Pritchard, University of Cincinnati
### ASEE’s Virtual Conference
#### Friday, June 26 Sessions

**#ASEEVC**

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<td>Moderators: Amber Genau, University of Alabama at Birmingham; Elizabeth Cady, National Academy of Engineering</td>
<td>Dr. James L. Huff, Harding University, Degnan William Lawrence, Amanda Coleman</td>
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<td>Presentations from groups with current NSF S-STEM grants (Scholarships in Science, Technology, Engineering and Math).</td>
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<td>Launching the Urban STEM Collaboratory</td>
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<td>Dr. Ronald B. Bucinell, Union College, Dr. Samuel Amanuel, Union College, Dr. Rebecca Cortez, Union College, Dr. Holli M. Frey, Union College, Prof. Joanne D. Kehlbeck, Union College, Prof. Michael E. Hagerman, Union College, Dr. David A. Cotter, Union College</td>
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<td>Year 3 of an S-STEM Summer Scholarship for a Sophomore Bridge Program</td>
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<td>Prof. Houshang Darabi, University of Illinois at Chicago, Rezvan Nazempour, University of Illinois at Chicago, Dr. Shanon Marie Reckinger, University of Illinois at Chicago, Dr. Peter C. Nelson, University of Illinois at Chicago, Dr. Renata A. Revelo, University of Illinois at Chicago, Prof. Jeremiah Abiade, University of Illinois at Chicago, Prof. Didem Ozevin P.E., University of Illinois at Chicago, Dr. Anthony E. Felder, University of Illinois at Chicago, Dr. Betul Bilgin, University of Illinois at Chicago, Dr. Yeow Siow, University of Illinois at Chicago</td>
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<td>F271B - NSF Grantees: S-STEM 1</td>
<td>NSF S-STEM EPIC Scholarship Program</td>
<td>10:00 A.M. - 10:20 A.M., ONLINE, A VIRTUAL CONFERENCE</td>
<td>Sponsor: NSF Grantees</td>
<td>Dr. Ronald B. Bucinell, Union College, Dr. Samuel Amanuel, Union College, Dr. Rebecca Cortez, Union College, Dr. Holli M. Frey, Union College, Prof. Joanne D. Kehlbeck, Union College, Prof. Michael E. Hagerman, Union College, Dr. David A. Cotter, Union College</td>
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<td>A Student Success Program for Engineering Undergraduate Students to Improve Retention and Graduation</td>
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<td>Prof. Heather Shipley, University of Texas at San Antonio, Dr. Rena Bizios, University of Texas at San Antonio, Dr. Krystel K. Castillo-Villar, University of Texas at San Antonio, Prof. Ruyan Guo, University of Texas at San Antonio, Dr. Timothy Yuen, The University of Texas at San Antonio</td>
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<td>Comparing Effectiveness of Peer Mentoring for Direct Admit and College-Ready Freshmen</td>
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<td>Dr. Teresa J. Cutright, University of Akron, Dr. Rebecca Kuntz Willits, University of Akron, Dr. Donald W. Ott</td>
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Supporting Excellent Engineers (SEE)
Dr. Daina Briedis, Michigan State University
Mr. Theodore Demetrius Caldwell, Michigan State University
Lisa Linnenbrink-Garcia, Michigan State University
Dr. Emily A. Bovee, Marquette University
Mr. Harrison Douglas Lawson, Michigan State University
Dr. Mark Urban-Lurain, Michigan State University
Alexandra Anderson Lee, Michigan State University
Ms. Amalia Krystal Lira, Michigan State University
Dr. Kristy A. Robinson, McGill University
Prof. S. Patrick Walton, Michigan State University

S-STEM Becoming Engaged Engineering Scholars (BEES): Insights from Year 1
Dr. Sura Alqudah, Western Washington University
Dr. Elizabeth Litzler, University of Washington
Dr. Joseph Arthur Brobst, Old Dominion University
Ms. Jill Davishahl, Western Washington University
Prof. Andrew G. Klein, Western Washington University

F305 - Perceptions, Reflections, Collaborations, and Student Support in Chemical Engineering
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Chemical Engineering Division

Moderators: Marina Miletic; Jennifer Pascal, University of Connecticut

Pre- and Post-Tenure: Perceptions of Requirements and Impediments for Chemical Engineering Faculty
Dr. Elif Miskioglu, Bucknell University
Dr. Nicholas Tymvios, Bucknell University
Dr. Eliana Christou, University of North Carolina at Charlotte
Dr. Benjamin B. Wheatley, Bucknell University

Student Confidence and Metacognitive Reflection with Correlations to Exam Performance in a FE Review Course in Chemical Engineering
Sheima J. Khatib, Texas Tech University
Dr. Roman Taraban, Texas Tech University
William D. Lawson P.E., Ph.D., Texas Tech University

Collaborative Project-based Learning Approach to the Enculturation of Senior Engineering Students into the Professional Engineering Practice of Teamwork
Ms. Yu Xia, Pennsylvania State University
Dr. Stephanie Cutler, Pennsylvania State University
Prof. Dawn McFadden, Pennsylvania State University

From Assessment to Research: Evolution of the Study of a

Two-Day Intervention for ChemE Sophomores
Dr. Bradley Ciccirello, Louisiana Tech University
Eric A. Sherer, Louisiana Tech University
Baker A. Martin, Clemson University
Dr. Marisa K. Orr, Clemson University

Supporting the Mental Health and Wellness of Chemical Engineering Students at the Department and College Levels
Dr. Andrew Maxson, The Ohio State University
Dr. David L. Tomasko, The Ohio State University

F306 - Around the Water Cooler: Ideas and Issues in Civil Engineering Education
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Civil Engineering Division
Moderator: Steven Burian, University of Utah

This session includes papers covering important topics related to citizen science, the identity of an engineer and civil engineering students, understanding the identities of students leaving civil engineering, and introducing high school students to engineering.

Introducing High School Students to Engineering Disciplines: Activities and Assessment
Dr. Nicolas Ali Libre, Missouri University of Science and Technology
Dr. Stuart Werner Baur, Missouri University of Science and Technology
Dr. Mark Fitch, Missouri University of Science and Technology
Prof. William Eric Showalter P.E., Missouri University of Science and Technology

Work in Progress: Citizen Scientists’ Description of an Engineer
Dr. Kenneth Stewart, Angelo State University
Dr. Daniel Ivan Castaneda, James Madison University
Dr. Azadeh Bolhari P.E., Angelo State University

Pre- and Post-Tenure: Perceptions of Requirements and Impediments for Faculty in Civil Engineering, Architectural Engineering, and Construction Disciplines
Dr. Nicholas Tymvios, Bucknell University
Dr. Elif Miskioglu, Bucknell University
Dr. Eliana Christou, University of North Carolina, Charlotte
Dr. Benjamin B. Wheatley, Bucknell University

Leaving Civil Engineering: Examining the Intersections of Gender, Disability, and Professional Identity
Dr. Cassandra J. McCall, Virginia Tech
Dr. Marie C. Paretti, Virginia Tech
Dr. Lisa D. McNair, Virginia Tech
Dr. Ashley Shew, Virginia Tech
Dr. Denise Rutledge Simmons P.E., University of Florida
Ms. Courtney Zongrone, Virginia Tech

**F314A - K-12 and Bridge Experiences in Engineering Education**

10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Educational Research and Methods Division
Moderators: Hoda Ehsan, Purdue University at West Lafayette; James Pembridge, Embry-Riddle Aeronautical University - Daytona Beach

Measuring Student Computational Thinking in Engineering and Mathematics: Development and Validation of a Non-programming Assessment
Mr. Timothy Ryan Duckett, University of Toledo
Dr. Gale A. Mentzer, Acumen Research and Evaluation, LLC

Work in Progress: What Does it Mean to Mentor? Conceptions of Mentoring in K-12 Outreach Programs
Ms. Sabina Anne Schill, University of Colorado, Boulder
Dr. Angela R. Bielefeldt, University of Colorado, Boulder

The Use of Engineering Notebooks in an RET Experience
Dr. Matthew T. Stimpson, North Carolina State University
Dr. Jerome P. Lavelle, North Carolina State University
Dr. Laura Bottomley, North Carolina State University

Participatory Action Research (PAR) as Formative Assessment of a STEM Summer Bridge Program
Dr. Susan Thomson Tripathy, University of Massachusetts, Lowell
Prof. Kavitha Chandra, University of Massachusetts, Lowell
Diane Reichlen, University of Massachusetts, Lowell

**F314B - Cognitive Skills Development**

11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Educational Research and Methods Division
Moderators: Michele Miller, Campbell University; James Pembridge, Embry-Riddle Aeronautical University - Daytona Beach

Analyzing Changes in Student Graph Reasoning and Comprehension Regarding Graph Axis Presentation
Mr. Justin Cory Willis, University Of Maine
Dr. Brett D. Ellis, University of Maine

Cognitive Skills Development Among Undergraduate Engineering Students
Miss Hannah Smith, Queen's University

Dr. Brian M. Frank, Queen's University

Usability of Data Visualization Activity Worksheets in the Context of a Critical Data Visualization Workshop: Findings from a Usability Survey
Dr. Vetria Byrd Ph.D., Purdue University, West Lafayette
Dr. Kendall Roark, Purdue University, West Lafayette
Brent T. Ladd, Purdue University

Work in Progress: Intuiting Intuition Through First-year Interviews
Ms. Bria M. Booth, Embry-Riddle Aeronautical University
Dr. Elif Miskioglu, Bucknell University
Dr. Kaela M. Martin, Embry-Riddle Aeronautical University

**F314C - Approaches to Encouraging Student Engagement**

11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Educational Research and Methods Division
Moderators: Ruth Ochia, Temple University; James Pembridge, Embry-Riddle Aeronautical University - Daytona Beach

Use of Adaptive Learning in an Engineering Technology Course: A Case Study
Dr. Nicole Barclay, University of North Carolina at Charlotte
Dr. Carl D. Westine, University of North Carolina at Charlotte
Angie Claris, University of North Carolina at Charlotte
Prof. Florence Martin, University of North Carolina at Charlotte

A Student Engagement Evaluation Methodology Inspired from Usability Engineering for Extracting Course Design Requirements
Ms. Sitong Wang, University of Cincinnati
Dr. Panagiotis Apostolellis, University of Virginia

Board Game Development as a Pedagogical Approach to Teaching Undergraduate Students in an Interdisciplinary Course that Addresses Contemporary Societal Issues
Michael N. Littrell, Tennessee Technological University
Dr. George Chitiyo, Tennessee Technological University
Dr. Lauren A. Michel, Tennessee Technological University
Dr. Steven R. Anton, Tennessee Technological University

Attendance and Social Interdependence in Game Development Labs
Brantly Edward McCord, Purdue University, West Lafayette
Dr. Ronald Erdei, University of South Carolina
Dr. David M. Whittinghill, Purdue University, West Lafayette
Dr. Marisa Exter, Purdue University, West Lafayette
### ASEE’S VIRTUAL CONFERENCE
#### FRIDAY, JUNE 26 SESSIONS

#### #ASEEVC

**F320 - Reimagining Engineering Ethics**

*11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE*

**Sponsor:** Engineering Ethics Division

**Moderators:** Sahithya Reddivari, Georgia State University; Nebojša Sebastijanovic, Milwaukee School of Engineering

**Ethics in Engineering or Engineering in Ethics?**

Mr. Grant A. Fore, Indiana University Purdue University, Indianapolis
Dr. Justin L. Hess, Purdue University
Dr. Andrew Katz, Virginia Tech

**Conceptualizing a Theory of Ethical Behavior in Engineering**

Mr. Luan Minh Nguyen, Iowa State University
Dr. Cristina Poleacovschi, Iowa State University
Dr. Kasey M. Faust, University of Texas at Austin
Kate Padgett Walsh, Iowa State University
Dr. Scott Grant Feinstein, Iowa State University
Dr. Cassandra Rutherford, Iowa State University

**What Can We Learn from Character Education? A Literature Review of Four Prominent Virtues in Engineering Education**

Dr. Jessica Koehler, Wake Forest University
Dr. Olga Pierrakos, Wake Forest University
Dr. Michael Lamb, Wake Forest University
Alana Demaske, Wake Forest University
Mr. Carlos Santos, Wake Forest University
Dr. Michael D. Gross, Wake Forest University
Mr. Dylan Franklin Brown, Wake Forest University

**Many Facets of Imagination: What Really Matters in Engineering Ethics Instruction?**

Mr. Yousef Jalali, Virginia Tech
Prof. Scott A. Civjan, University of Massachusetts Amherst

**F323 - A Technology Potpourri I**

*11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE*

**Sponsor:** Engineering Technology Division

**Moderator:** Mary Johnson, Purdue University at West Lafayette

A diverse range of topics will be presented in this session.

**Bioreactor Design, Automation, and Optimization - A Multidisciplinary Approach**

Dr. Vassilios Tzouanas, University of Houston, Downtown
Dr. Lisa Deane Morano, University of Houston, Downtown
Steely Earl Varon Falar, University of Houston, Downtown

Hung Pham
Mr. Anish Khatiwada, University of Houston, Downtown
Mr. Jonathan Lopez

**Design and Implementation of a Smart and Cost-effective Indoor Irrigation System (SCEIIS)**

Dr. Reg Pecen, Sam Houston State University
Dr. Faruk Yildiz, Sam Houston State University
Megan Gibson

**Expanding Engineering and Technology Opportunities to Students in the Border Region Through International Collaboration**

Dr. Jesus A. Gonzalez-Rodriguez, University of Texas Rio Grande Valley
Dr. Immanuel Edinbarough P.E., University of Texas Rio Grande Valley
Ms. Adriana Rios Santiago, Texas Southmost College
Dr. Anabel Pineda-Briseño, Tecnologico Nacional de Mexico / Instituto Tecnologico de Matamoros

**Using ePortfolios to Facilitate Transfer Student Success**

Prof. Elaine M. Cooney, Indiana University Purdue University, Indianapolis
Elizabeth Freije, Indiana University Purdue University, Indianapolis
Ms. Mengyuan (Alice) Zhao, Indiana University Purdue University, Indianapolis

**F324 - ENT Division Technical Session: Making and Maker Spaces**

*10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE*

**Sponsor:** Entrepreneurship & Engineering Innovation Division

**Moderator:** Jason Forsyth, James Madison University

"Teams Teaching Engineering": A Flexible, Hands-on Project Promoting Maker Space Usage in Large Introductory Lecture Classes

Dr. Kimberly B. Demoret P.E., Florida Tech

**B-Fab: Cultivating Student Learning in the Maker Space Through Faculty Development**

Dr. Margot A. Vigeant, Bucknell University
Dr. Alan Cheville, Bucknell University
Prof. Donna M. Ebenstein, Bucknell University
Matthew Lamparter, Bucknell University
Ms. Sabrina Shankar, Bucknell University
Dr. Nathan P. Siegel P.E., Bucknell University
Prof. Stu Thompson, Bucknell University

Schedule subject to change. Please go to [www.asee20.pathable.co](http://www.asee20.pathable.co) for up-to-date information.
Creating a Maker Space for Crossdisciplinary Teaching and Collaboration with Limited Funding

Dr. David G. Alexander, California State University, Chico
Dr. Colleen Robb, Florida Gulf Coast University

F327A - First-year Programs: Teams and Teamwork
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: First-Year Programs Division
Moderators: Robin Fowler, University of Michigan; Randy Brooks, Texas A&M University

Developing and Piloting a Survey to Assess Dissatisfaction of Women in Student Teams

Dr. Laura Hirshfield, University of Michigan
Dr. Robin Fowler, University of Michigan
Ms. Emily A. Madden, University of Michigan

Work in Progress: Structured Teamwork for Learning Equity in First-year Engineering Design

Dr. Emma Tevaarwerk DeCosta, Northwestern University
Kathleen Carmichael, Northwestern University
Dr. Lisa M. Davidson, Northwestern University
Dr. Ordel Brown, Northwestern University
Elise Gruneisen, Northwestern University

Effectiveness of Techniques to Develop and Assess the Teamwork Skills of First-year Engineering Students

Dr. Jean Carlos Batista Abreu, Elizabethtown College
Dr. Brenda Read-Daily, Elizabethtown College

Work in Progress: A Study on Motivation in Teams Using Self Determination Theory

Prof. Mirna Mattjik, Colorado School of Mines
Dr. Megan Sanders, Colorado School of Mines

Work in Progress: Automating Anonymous Processing of Peer Evaluation Comments

Mr. Siqing Wei, Purdue University, West Lafayette
Mr. Rui Wang, Purdue University, West Lafayette
Dr. Matthew W. Ohland, Purdue University, West Lafayette
Dr. Gaurav Nanda, Purdue University, West Lafayette
F327C - First-year Programs: Research and Spatial Skills
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: First-Year Programs Division
Moderators: Leila Keyvani Someh, Northeastern University; Brooke Morin, Ohio State University

Undergraduate research in the first year and integrating spatial skills.
You Had Me at “Undergraduate Research”: How One Institution Achieved Incredible Results in the First Year of a Formal Program to Place Freshmen (and Sophomores) in Research Labs, While Helping Students Chip Away at the Cost of College
Susan Elaine Benzel, Colorado State University

Using Origami and CAD as Tools for Spatial Ability Training for First-year Female Engineering Students
Ing. Mayari Illarij Serrano Anazco, Purdue University, West Lafayette
Dr. Suzanne Zurn-Birkhimer, Purdue University, West Lafayette

Infographic Pedagogy for First-year College Students
Asefeh Kardgar, Purdue University, West Lafayette
Dr. Rajeswari Sundararajan, Purdue University, West Lafayette

Work in Progress: Spatial Visualization Intervention in a First-semester Engineering Course
Dr. Emily J. Schiavone, Viterbo University

Exposing First-year Engineering Students to Research-based Technical Communication Through the Use of a Nanotech Project
Cassie Wallwey, Ohio State University
Ms. Tara Gupte Wilson, Ohio State University
Mr. Paul Alan Clingan, Ohio State University
Mr. Alexander James Egyed, Ohio State University
Olivia Vick, Ohio State University
Dr. Michael Parke, Ohio State University

F327D - First-Year Programs: Major Choice
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: First-Year Programs Division
Moderators: John Sangster, Northeastern University; Laura Bottomley, North Carolina State University at Raleigh

Papers about how students make decisions about their major.
It's All About the Feels: How and Why Students’ Feelings about their Engineering Program Change
Dr. Laura Hirshfield, University of Michigan
Stacie Edington, University of Michigan
Michael Dailey, University of Michigan

Parameterizing Major Discernment for First- and Second-year Engineering Students
Brian J. Smith, University of Notre Dame
Elizabeth Kerr, University of Notre Dame

Parent and Family Influence on First-year Engineering Major Choice
Dr. Michelle J. Jarvie-Eggart, Michigan Technological University
Miss Amanda Marie Singer, Michigan Technological University
Jason Mathews, Michigan Technological University

Venturing into Discipline-specific Activities for Different Sections of the Same Introductory Engineering Design Course
Amanda Christine Bordelon, Utah Valley University
Dr. Susan L. Thackeray , Utah Valley University
Dr. Sean S. Tolman, Utah Valley University
Prof. Jane M. Loftus, Utah Valley University

Technology Interests of First-year ECE Students
Dr. J.W. Bruce, Tennessee Technological University
Dr. Mahnas Jean Mohammadi-Aragh, Mississippi State University

F330 - Computing and Information Technology Division Technical Session 8
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Computing and Information Technology Division
Moderators: Reza Sanati-Mehrizy, Utah Valley University; Mudasser Wyne, National University

This session includes papers on a variety of topics pertaining to computing and information technology.

A Real-time Attendance System Using Deep-learning Face Recognition
Dr. Weidong Kuang, University of Texas Rio Grande Valley
Mr. Abhijit Baul, University of Texas Rio Grande Valley

Change of Major Policy and Its Effects
Dr. Simeon Ntafos, University of Texas at Dallas

Training and Teaching Students and IT Professionals on High-throughput Networking and Cybersecurity Using a Private Cloud
Dr. Jorge Cricigno, University of South Carolina
Prof. Elias Bou-Harb, University of Texas at San Antonio
Mr. Elie Kfoury, University of South Carolina
Mr. Jose Gomez, University of South Carolina
Antonio Mangino, University of Texas at San Antonio
Final Report on LEAP at UVU: An NSF S-STEM Project
Dr. Afsaneh Minaie, Utah Valley University
Dr. Reza Sanati-Mehrizy, Utah Valley University
Janis P. Raje, Utah Valley University

**F332 - Study Abroad Experiences**

*Intl Div Tech Session 9*

11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE

**Sponsor:** International Division

**Moderators:** Gloria Kim, University of Florida; Mary Dawson, Illinois Institute of Technology

This session discusses the challenges and benefits of study-abroad experiences, alternatives to the traditional study abroad, and an interesting tool to help students reflect on the emotional aspects of study abroad.

**An Exploration of Faculty-led, Short-term Engineering Study Abroad Programs Offered by U.S. Institutions**

Dr. Jessica D. Ventura, Endicott College

**Critical Incident Assessment as a Tool to Reflect on Students’ Emotional Responses During International Experiences**

Mr. Matthew Korey, Purdue University
Caitlyn M. Clarkson, Purdue University
Ms. Kali D. Frost, Purdue University
Mr. Joseph Andler, Purdue University
Congying Wang, Purdue University
Dr. Melissa S. Reeves, Tuskegee University
Carol A. Handwerker, Purdue University

**International Experiences to Promote the Globalization of U.S Engineering Students: Challenges, Benefits, and New Perspectives**

Dr. Heather N. Yates, Oklahoma State University
Dr. Blake Wentz, Milwaukee School of Engineering
Ms. Sreemala Das Majumder, Oklahoma State University

**Overcoming the Challenges to Launch a Successful Initiative of an Engineering Faculty-led Travel Course While Boosting Interdisciplinary Collaborations**

Dr. Yanjun Yan, Western Carolina University
Dr. Nelson A. Granda Marulanda, Western Carolina University
Dr. B. David Tyler, Western Carolina University
Dr. Hugh Jack P.E., Western Carolina University
Mrs. Lauren R. Bishop, Western Carolina University

**F333A - Pre-college Engineering Education Division Technical Session 15**

11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE

**Sponsor:** Pre-College Engineering Education Division

**Moderator:** Martha Cyr, Worcester Polytechnic Institute

**Effects of High School Dual-Credit Introduction to Engineering Course on First-year Engineering Student Self-efficacy and the Freshman Experience**

Ms. J. Jill Rogers, University of Arizona
Dr. Amy Annette Rogers, Delaware State University
Prof. James C. Baygents, University of Arizona

**Embedding Teacher Professional Learning into the Student-focused GEAR UP Engineering Summer Camp**

Ryan Barlow, Utah State University
Dr. Max L. Longhurst, Utah State University
Prof. Kurt Henry Becker, Utah State University

**Engineering Outreach: Ambassador Girls Empowering Girls in the Field**

Dr. Sarah Hug, Colorado Evaluation and Research Consulting
Dr. Suzanne Eyerman, Fairhaven Research and Evaluation
Dr. Trina L. Fletcher, Florida International University
Dr. Araceli Martinez Ortiz, Texas State University
Dr. Michael A. Solty, University of Colorado, Boulder

**Evaluating Student Success in a Pre-college General Engineering Program**

Dr. Duncan Davis, Northeastern University
Mr. Matthew Burns, Northeastern University
Dr. John Sangster P.E., Northeastern University
Prof. Constantine Mukasa, Northeastern University
Brian Patrick O’Connell, Northeastern University
Elizabeth Quinn, Northeastern University
Ms. Alice Smith
Dr. Kathryn Schulte Grahame, Northeastern University

**Evaluation of Engineering Problem-framing Professional Development for K-12 Science Teachers**

Miss Meg E. West, Ohio State University
Dr. J. Blake Hylton, Ohio Northern University
Dr. Patrick James Herak, Ohio State University
Mr. Bruce Wellman, Olathe Engineering Academy at Northwest High School
F333B - Pre-College Engineering Education Division Technical Session 20
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Pre-College Engineering Education Division
Moderator: Madhurima Das, NuVu Studio

The Impact of Residential Engineering Summer Academies on Middle and High School Students
Dr. Vemitra M. White, NASA Marshall & Stennis Space Flight Centers/Texas State University
Dr. Debra Prince, Mississippi State University
Dr. Jamel Hill Alexander, DoD

The UMES Summer Transportation Institute - A Novel Approach to Engaging Minority Students in a U.S. Department of Transportation Summer Program for Careers in Transportation
Dr. Joseph O. Arumala PE, University of Maryland Eastern Shore
Dr. Joseph Nii Dodu Dodoo, University of Maryland Eastern Shore

Using an Embedded Researcher Approach to Explore Student Outcomes and Relationship Development during an Intensive Engineering Apprenticeship Program
Ms. Lori Caldwell, Utah State University
Dr. Angela Minichiello P.E., Utah State University

Influences for Engineering Majors: Results of a Survey from a Major Research University
Dr. Sandra B. Nite, Texas A&M University
Devyn Chae Rice
Rayan Tejanii, Allen Academy

Valued Defiance - Teachers’ Views on STEM and Students
Dr. Johannes Strobel, University of Missouri
Dr. Alexander Franz Koch, University of Teacher Education, Fribourg, Switzerland
Mr. Hao He, University of Missouri-Columbia

Real-world Examples and Sociotechnical Integration: What’s the Connection?
Jacqueline Erickson, Colorado School of Mines
Dr. Stephanie Claussen, Colorado School of Mines
Dr. Jon A. Leydens, Colorado School of Mines
Dr. Kathryn Johnson, Colorado School of Mines
Dr. Janet Y. Tsai, University of Colorado, Boulder

Semiconductors and Society: A First-year Seminar
Prof. John A. Nestor, Lafayette College

WIP: A Case Study of Integrating Inclusive Engineering Skills into a Middle-years Biomedical Engineering Course via Model-based Reasoning
Dr. Maysam Nezafati, Georgia Institute of Technology
Ms. Mel Chua, Georgia Institute of Technology
Prof. Joseph M. LeDoux, Georgia Institute of Technology

F338 - Mechanical Engineering Technical Session: Mechatronics & Simulation
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Mechanical Engineering Division
Moderator: Rungun Nathan, Pennsylvania State University, Berks Campus

This session will contain a variety of papers on mechatronics and simulation with a focus on best practices and practical application.

Adding a Simulation Module to a Primarily Experimental Mechanical Engineering Course
Dr. Reihaneh Jamshidi, University of Hartford
Dr. Ivana Milanovic, University of Hartford

Appropriate and Ethical Finite Element Analysis in Mechanical Engineering: Learning Best Practices Through Simulation
Dr. Benjamin B. Wheatley, Bucknell University

Building the Bridge Between Mechanical Curricula and Practical Application through a Mechatronic Project
Mrs. Lan He, Beihang University
Prof. Jingjun Yu, Beihang University

WIP: A Systems-level Approach for an Introductory Mechatronics Laboratory Course for Undergraduate Mechanical Engineering Students
Mr. Karnveer Gill, Greensea Systems Inc.
Nick Morales
Dr. David Quintero, San Francisco State University

F344 - Sociotechnical Integration
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Liberal Education/Engineering & Society Division
Moderators: Kathryn Neeley, University of Virginia; Juan Lucena, Colorado School of Mines

If Engineers Solve Problems, Why Are There Still So Many Problems to Solve?: Getting Beyond Technical “Solutions” in the Classroom
Dr. Cynthia Helen Carlson P.E., Merrimack College
Ms. Catherine Woodworth Wong, Merrimack College

Schedule subject to change. Please go to www.asee20.pathable.co for up-to-date information.
F339 - Teaching Statics: What and How?
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Mechanics Division
Moderators: Amie Baisley, University of Florida; Brian Self, California Polytechnic State University, San Luis Obispo

Does Physics Really Need to be a Prerequisite to Statics?
Dr. Amir H. Danesh-Yazdi, Rose-Hulman Institute of Technology
Dr. Aimee Monique Cloutier, Rose-Hulman Institute of Technology
Dr. Phillip Cornwell, Rose-Hulman Institute of Technology

WIP Statics Abroad: Lessons in Pedagogy from a Short-term Study Abroad Mechanics Course
David Allen Evenhouse, Purdue University at West Lafayette
Prof. Charles Morton Krousgrill, Purdue University, West Lafayette
Prof. Jeffrey R. Rhoads, Purdue University, West Lafayette
Dr. Edward J. Berger, Purdue University, West Lafayette
Prof. Jennifer DeBoer, Purdue University, West Lafayette

Who Needs the Method of Sections and the Method of Joints? Just Pick a Strategy and Define Your System!
Dr. Phillip Cornwell, Rose-Hulman Institute of Technology
Dr. Amir Hossein Danesh Yazdi, Rose-Hulman Institute of Technology
Dr. Aimee Monique Cloutier, Rose-Hulman Institute of Technology

Impact of a Sketch-based Tutoring System at Multiple Universities
Dr. Vimal Kumar Viswanathan, San Jose State University
Josh Taylor Hurt
Dr. Tracy Anne Hammond, Texas A&M University
Dr. Benjamin W. Caldwell, LeTourneau University
Dr. Kimberly Grau Talley P.E., Texas State University
Dr. Julie S. Linsey, Georgia Institute of Technology

F340 - Minorities in Engineering Division Technical Session 9
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Minorities in Engineering Division
Moderators: Fernando Monroy; Christopher Carr, George Mason University

An Exploratory Study of Intentionality Toward Diversity in STEM Faculty Hiring
Ms. Samara Rose Boyle, Rice University
Dr. Canek Moises Luna Phillips, Rice University
Dr. Yvette E. Pearson P.E., Rice University
Dr. Reginald DesRoches, Rice University
Prof. Stephen P. Mattingly, University of Texas at Arlington
Dr. Anne Nordberg, Owl Evaluations
Prof. Wei Wayne Li, Texas Southern University
Prof. Hanadi S. Rifai P.E., University of Houston

Analysis of the State of Tenure-line Black Engineering Faculty in Research-intensive (R1) Institutions
Dr. Girum Urgessa P.E., George Mason University

Toward the Development of a Scale Linking Underrepresented Engineering Faculty’s Workplace Experiences and Career Outcomes
Dr. Jeremi S. London, Virginia Polytechnic Institute and State University
Dr. Stephanie G. Adams, University of Texas at Dallas
Julia Machele Brisbane, Virginia Polytechnic Institute and State University
Miss Crystal M. Pee, Virginia Polytechnic Institute and State University

F341A - Multidisciplinary Learning Experiences
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Multidisciplinary Engineering Division
Moderators: Anderson Prewitt, University of South Florida; Fan Xiong; Cynthia Barnicki, Milwaukee School of Engineering

Innovation-based Learning: Enhancing Innovative Problem Solving and Higher-order Thinking in Education Through Multidisciplinary Collaboration
Ms. Ellen M. Swartz, North Dakota State University
Mary Pearson, North Dakota State University
Ms. Lauren Singelmann, North Dakota State University
Ryan Striker P.E., North Dakota State University
Mr. Enrique Alvarez Vazquez, North Dakota State University

First-year Engineering Program Evaluation: Understanding Senior Students’ Perceptions About Their First-year Experience
Dr. Homero Murzi, Virginia Polytechnic Institute and State University
Jazmin Jurkiewicz, Virginia Polytechnic Institute and State University
Dr. Kenneth Reid, Virginia Polytechnic Institute and State University
Rachel Rosenbaum, Virginia Tech Department of Engineering Education

ASPiRe, a Ten-week Summer One-to-One Mentoring Program and Its Impact on Undergraduate Student Learning and Confidence

Dr. Lynn A. Albers, Hofstra University
Dr. Edward H. Currie, Hofstra University
Dr. David M. Rooney, Hofstra University
Robyn Alma, Hofstra University
Mr. Travis Chen Shen, Hofstra University

Sustainable Engineering: A Comparative Study of Freshman and Senior Perspectives

Dr. Lynal Albert, Tarleton State University

WIP: Development of an Interdisciplinary MOOC that Introduces the NAE Grand Challenges for Engineering

Dr. Haolin Zhu, Arizona State University
Amy Trowbridge, Arizona State University
Ms. Jill L. Roter, Arizona State University

F341B - Innovations for Multidisciplinary Programs

11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Multidisciplinary Engineering Division

Moderators: Elise Barrella, Wake Forest University; Jack Bringardner, New York University Tandon School of Engineering

This session highlights innovations from 10 programs that have adopted the vertically integrated project model to increase collaborative and multidisciplinary engineering education. Discussion between the authors and the session attendees is expected and encouraged.

Breaking Down the Silos: Innovations for Multidisciplinary Programs

Dr. Michaela E. Amoo, Howard University
Dr. Jack Bringardner, New York University
Prof. Jen-Yeu Chen, National Dong Hwa University
Prof. Edward J. Coyle, Georgia Institute of Technology
Ms. Jillana Finnegan, Boise State University
Prof. Charles J. Kim, Howard University
Dr. Patricia D. Koman, University of Michigan
Ms. Magdalini Z. Lagoudas, Texas A&M University
Dr. Donna C. Llewellyn, Boise State University
Dr. Louise Logan, University of Strathclyde
Julie Sonnenberg-Klein, Georgia Institute of Technology
Dr. Nadia Millis Trent, University of Pretoria
Dr. Scott Munro Strachan, University of Strathclyde
Dr. Bennett C. Ward, Virginia Commonwealth University

F342 - New Engineering Educators 3 - Grading: Grate or Great

11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: New Engineering Educators Division

Moderators: Rebecca Reck, Kettering University; Vimal Viswanathan, San Jose State University

A Chegg® Era Model for HW

Dr. Kurt M. DeGoede, Elizabethtown College

Closing the Homework Feedback Loop Using Dual-Submission-with-Reflection Homework Methodology

Dr. Timothy Aaron Wood, The Citadel
Dr. Dan D. Nale, The Citadel
Dr. Ryan Kent Giles P.E., The Citadel

Fantastic Cheats: Where and How to Find Them? How to Tackle Them?

Dr. Ashish D. Borgaonkar, New Jersey Institute of Technology
Dr. Christina Marie Zambrano-Varghese, Rutgers University-Newark
Dr. Jaskirat Sodhi, New Jersey Institute of Technology
Dr. Swapnil Moon, New Jersey Institute of Technology

Grading by Competency and Specifications: Giving Better Feedback and Saving Time

Dr. Jennifer Pascal, University of Connecticut
Dr. Troy J. Vogel, University of Notre Dame
Dr. Kristina Wagstrom, University of Connecticut

Scalable Implementation of Metacognitive Homework: Comparing Experiences at Large and Small Institutions

Dr. Derek Breid, Saint Vincent College
Ms. Tara Gupte Wilson, Ohio State University
Dr. Ann D. Christy P.E., Ohio State University

F345 - Engineering Physics and Physics Division Technical Session 3

11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Engineering Physics and Physics Division

Moderators: Todd Zimmerman, Robert Ross, University of Detroit Mercy

Socioeconomic and Gender Differences in Students’ Perceptions of Physics in Mexican Schools

Prof. Genaro Zavala, Tecnologico de Monterrey and Universidad Andres Bello
F351A - Women in Engineering Division Technical Session 5
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Women in Engineering Division
Moderators: Chrysanthe Demetry, Worcester Polytechnic Institute; Janet Callahan, Michigan Technological University
How Students View the Role of Faculty Advisors in the SWE Organization
- Dr. Diane L. Peters P.E., Kettering University
- Dr. Maryam Darbeheshti, University of Colorado Denver
- Dr. Gloria Guohua Ma, Wentworth Institute of Technology
- Dr. Karinma M. Vernaza, Gannon University
- Dr. Alexa N. Rihanah, University of Detroit Mercy
- Dr. Christina Remucal, University of Wisconsin-Madison
- Prof. Stephanie G. Wettstein, Montana State University; MEERC

Nascent Professional Identity Development in Freshman Architecture, Engineering, and Construction Women
- Dr. Andrea Nana Ofori-Boadu, North Carolina A&T State University
- Mr. Victor Ofori-Boadu, Penuel Consult Inc.
- Mr. Jacob Randall Vanderpool, North Carolina Agricultural and Technical State University
- Dongyang Deng, North Carolina Agricultural and Technical State University

STEM Program for Female High School Students
- Dr. Jiahui Song, Wentworth Institute of Technology
- Dr. Douglas Eric Dow, Wentworth Institute of Technology
- Dr. Gloria Guohua Ma, Wentworth Institute of Technology
- Dr. Weihui Li, Biomedical Engineering, Wentworth Institute of Technology
- Dr. Lili Ma, New York City College of Technology

Work in Progress: Studying the Factors Affecting Women Recruitment and Retention in Engineering
- Dr. Anu Osta, Rowan University

Dr. Jennifer Kadlowiec, Baldwin Wallace University
Miss Alissa Papernik
Amanda Ferreira Dias-Liebold, Rowan University

Girl Scouts STEM Day Program
- Dr. Jiahui Song, Wentworth Institute of Technology
- Dr. Douglas Eric Dow, Wentworth Institute of Technology
- Dr. Gloria Guohua Ma, Wentworth Institute of Technology
- James R. McCusker PhD, Wentworth Institute of Technology

Dance-a-Bit: Integrating Dance with Teaching Algorithmic Thinking
- Ms. Litany H. Lineberry, Mississippi State University
- Dr. Sarah B. Lee, Mississippi State University

F351B - Women in Engineering Division Technical Session 6
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Women in Engineering Division
Moderators: Jinny Rhee, San Jose State University; Kristi Shryock, Texas A&M University

Does Adding “Helping Disciplines” to Engineering Schools Contribute to Gender Parity?
- Dr. Agnes Germaine d'Entremont P.Eng., University of British Columbia, Vancouver
- Dr. Kerry Greer, University of British Columbia
- Dr. Katherine A. Lyon, University of British Columbia, Vancouver

Women in Engineering: Promoting Identity Exploration and Professional Development
- Dr. Maureen C. Smith, San Jose State University
- Dr. Jinny Rhee, San Jose State University
- Dr. Belle Wei, San Jose State University

A Phenomenological Exploration of Women’s Lived Experiences and Factors that Influence their Choice and Persistence in Engineering
- Dr. Shawn Fagan, Temple University

Developing a Meta-Model of Critical Factors for Females in STEM with Application to a Minority-serving Institution
- Dr. Lourdes A. Medina, University of Puerto Rico-Mayaguez
- Dr. Saylisse Davila, University of Puerto Rico-Mayaguez
- Miss Olga Beatriz Rivera, Amgen Manufacturing Limited
- Nolgie Oquendo-Colon, University of Puerto Rico-Mayaguez
- Dr. Maria Angelica Velazquez, Montana State University

Exploring the Educational Experiences of Women Who Persisted in Engineering: A Qualitative Case Study
- Courtney Green P.E.
F352 - Community Engagement Division Technical Session 4
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Community Engagement Division
Moderator: Arthur Kney, Lafayette College

Aspirations: Overcoming Barriers to Success through Pre- and Post-secondary School Partnerships
Chelsea Cefalu, Lafayette College
Dr. Arthur D. Kney, Lafayette College

Engagement in Practice: A Second Year Project-based Learning Sequence
Dr. Melissa Morris, Embry-Riddle Aeronautical University - Worldwide

Deepening Engineering Skills through Community Engaged Learning in a Sustainable Energy Systems Course
Dr. Maija A Benitz, Roger Williams University
Dr. Li-Ling Yang, Roger Williams University

Lessons Learned from a Summer Bridge Research Partnership Between a Community College and a University
Dr. Peter Golding, University of Texas at El Paso
Mrs. Helen Elizabeth Geller, University of Texas at El Paso and El Paso Community College
Dr. Diane Elisa Golding, University of Texas at El Paso
Ms. Ana Karen Jimenez Enciso, University of Texas at El Paso
Dr. Kwame Opuni, University of Houston-Downtown (Retired)
Mr. Anand Raj, University of Texas at El Paso
Mr. Mike Thomas Pitcher, University of Texas at El Paso
Ms. Carla Ann Judith Navar, University of Texas at El Paso
Prof. Paul E. Hotchkin, El Paso Community College

Professional Ethics LIVE! - A Community Partnership in Continuing Education
William D. Lawson P.E., Ph.D., Texas Tech University
Ms. Heather R. Keister PE, Freese and Nichols

F360 - FOCUS ON EXHIBITS: Virtual Showcase
12:00 P.M. - 1:00 P.M.
Sponsor: ASEE Headquarters
Live interaction with sponsors and exhibitors.

F371A - NSF Grantees: S-STEM 3
10:40 A.M. - 11:00 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: NSF Grantees
Moderators: Amber Genau, University of Alabama at Birmingham; Valerie Carr, San Jose State University

Presentations from groups with current NSF S-STEM grants (Scholarships in Science, Technology, Engineering, and Math).

Closing the STEM Labor Gap through a Path to Graduation for Low Income, Rural Students
Dr. Paul D. Adams, University of Arkansas
Xochitl Delgado Solorzano, University of Arkansas
Dr. Wenjuo Lo, University of Arkansas
Dr. Carol S. Gattis, University of Arkansas
Jennie S. Popp Ph.D., University of Arkansas Honors College

A Summer Calculus Experience to Encourage Development of Community and Self-efficacy Building of Civil Engineering Students
Dr. Mary Katherine Watson, The Citadel
Dr. Simon Thomas Ghanat P.E., The Citadel
Dr. Timothy Aaron Wood, The Citadel
Dr. William J. Davis P.E., The Citadel
Dr. Kevin C. Bower, The Citadel
Dr. Tara Hornor, The Citadel
Dr. Ronald W. Welch P.E., The Citadel

Improving Student Success in STEM with a Student Success Coach and Intrusive Advising
Dr. Thomas G. Carter, College of DuPage
Dr. Richard H. Jarman, College of DuPage
Susan Fenwick, College of DuPage
Mr. Thomas Olai Schrader, College of DuPage
Dr. Cory Michael DiCarlo, College of DuPage

Understanding Student Retention in Engineering
Dr. Robin A.M Hensel, West Virginia University
Mr. Joseph Dygert, West Virginia University
Dr. Melissa Lynn Morris, University of Nevada - Las Vegas

A Study of the Effects of Peer Tutoring in Relation to Student GPA
Dr. Scott Steinbrink, Gannon University
Mr. Adam Finn Nogaj
Dr. Karinna M. Vernaza, Gannon University
Dr. Lin Zhao, Gannon University
Dr. Saeed Tiari, Gannon University
F371B - NSF Grantees: REU 2
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: NSF Grantees
Moderators: Amber Genau, University of Alabama at Birmingham; Katie Evans, Louisiana Tech University

Presentations from groups with current NSF REU (Research Experiences for Undergraduates) programs.

**Outcomes and Assessment of Three Years of an REU Site in Multiscale Systems Bioengineering**
- Dr. Timothy E. Allen, University of Virginia

**The Differences Between Individual Project and Team Project Settings in an Interdisciplinary REU Site**
- Dr. Hua Li, Texas A&M University, Kingsville
- Prof. Kai Jin, Texas A&M University, Kingsville

**An NSF REU Site with Integrated Academia-Industry Research Experience – Development, Implementation, and Lessons Learned**
- Dr. Zhaooshu Jiang P.E., San Francisco State University
- Dr. Juan M. Caicedo, University of South Carolina
- Dr. Robert Petrulis, EPRE Consulting LLC

**Expanding Summer Research Programs at an NSF ERC: Innovation, Assessment, and Adaptation**
- Maeve Drummond Oakes, Purdue University
- Kristin Everett, Western Michigan University
- Dr. Michael T. Harris, Purdue University at West Lafayette
- Dr. Maryanne Sydlik, Western Michigan University
- Dr. Allison Godwin, Purdue University at West Lafayette

F371C - NSF Grantees: S-STEM 4
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: NSF Grantees
Moderator: Ronald Bucinell, Union College

Presentations from groups with current NSF S-STEM grants (Scholarships in Science, Technology, Engineering, and Math).

**Opportunities in Manufacturing of Advanced Materials for Second Career-Seeking Students**
- Dr. Oleksandr Kravchenko, Old Dominion University
- Dr. Konstantin Cigularov, Old Dominion University
- Tancy J. Vandecar-Burdin, Old Dominion University

**Developing a Culturally Adaptive Pathway to Success: Implementation Progress and Project Findings**
- Dr. Eun-Young Kang, California State University, Los Angeles
- Dr. Jianyu "Jane" Dong, California State University, Los Angeles
- Matthew Jackson Ph.D., California State University, Los Angeles

- Dr. Emily L. Allen, California State University, Los Angeles
- Dr. Daniel Galvan, California State University, Los Angeles

**NSF S-STEM Project Update: A Pathway to Completion for Pursuing Engineering and Engineering Technology Degrees**
- Dr. Kim Bullington, Old Dominion University
- Dr. Cynthia Tomovic, Old Dominion University
- Dr. Vukica M. Jovanovic, Old Dominion University
- Dr. Anthony W. Dean, Old Dominion University
- Dr. Rafael Landaeta, Old Dominion University

**S-STEM Lessons Learned: Supporting Community College Transfer Pathways and Access to High-Impact Practices during Transfer Transition**
- Dr. Rebekah Dupont, Augsburg University
- Dr. Nancy A. Rodenborg, Augsburg University

**The S-STEM Program in Mathematics and Its Impact on Student Success**
- Prof. Tuncay Aktosun, University of Texas at Arlington
- Dr. Yolanda Parker, Tarrant County College
- Prof. Jianzhong Su, University of Texas at Arlington
Dr. Subodh Bhandari, California State Polytechnic University, Pomona
Dr. Fang Tang, California State Polytechnic University, Pomona
Dr. Zekeriya Aliyazicioglu, California State Polytechnic University, Pomona
Dr. Amar Raheja, California State Polytechnic University, Pomona
Dr. Erika DeJonghe, California State Polytechnic University, Pomona

Outcomes and Lessons Learned from a NSF-REU Site on Metrology and Nondestructive Inspection
Dr. Mathew Kuttolamadom, Texas A&M University
Dr. Jyhwen Wang, Texas A&M University

F399A - SPONSOR TECHNICAL SESSION: Multi-Level Curriculum Assessment using Gradescope - Presented By: University of Illinois Urbana Champaign with Gradescope by Turnitin
11:00 A.M. - 11:20 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Sponsored Sessions

F399B - SPONSOR TECHNICAL SESSION: Quick Wins to Bring Entrepreneurial Mindset into your Courses Presented by Engineering Unleashed
11:20 A.M. - 11:40 A.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Sponsored Sessions

F413 - DEED Panel
1:00 P.M. - 1:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Design in Engineering Education Division
Moderators: Zahed Siddique, University of Oklahoma; Jessica Kuczenski, Santa Clara University

DEED Panel

F414 - FIE Steering Committee: Executive Session
2:00 P.M. - 3:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Educational Research and Methods Division

F415 - ECE Division Business Meeting
2:00 P.M. - 3:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Electrical and Computer Division
Annual business meeting for the ECE Division.

F416 - The Latest Research and Pedagogy in Energy Conversion and Conservation
1:00 P.M. - 1:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Energy Conversion and Conservation Division
Moderators: Seyed Mousavinezhad, Idaho State University; Chengying Xu, North Carolina State University at Raleigh; Siamak Farhad, The University of Akron
Speakers: Charles K. Alexander, Cleveland State University; Dr. Aaron St. Leger, United States Military Academy; Dr. Howard B. Rockman, The University of Illinois at Chicago; Dr. Barry D. Ganapol, The University of Arizona; Dr. Herbert L. Hess P.E., University of Idaho; Dr. Dagmar Niebur, Drexel University

Panel members from academia, industry, and government will discuss the latest research and pedagogy in energy conversion and conservation. Smart energy systems, renewable systems, and new forms of energy conversion will be discussed, as well as teaching innovations to keep students engaged in these important engineering subject areas. This session is for those interested in academia-industry connections and in broadening participation in engineering and engineering technology.

F418 - Maker Spaces: Developing and Broadening our Knowledge, Skills, and Implications in their Value
1:00 P.M. - 1:30 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Design Graphics Division
Moderators: Sheryl Sorby, University of Cincinnati; Matthew Wettergreen, Rice University

Maker space’s top three benefits include:
(1) developing creativity skills;
(2) developing critical thinking and problem-solving skills; and
(3) applying knowledge to practical problems (Nagel, 2018).
Those involved in maker-space activities have also been found to collaborate more with others and to have gained confidence in their abilities. This participatory panel session focuses on recognizing, sharing, and developing our knowledge, skills, and implications associated with...
the value of maker spaces. While not inclusive, this session also examines
maker-space ideas, definitions, purpose, materials, activities, locations,
furniture, and all that make maker spaces and their impact.

**F422 - Faculty Advancement Panel**

1:00 P.M. - 1:30 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsors: Engineering Management Division; Faculty Development Division

Moderator: Jena Asgarpoor, University of Nebraska - Lincoln

Speakers: Prof. Edward A. Pohl, University of Arkansas; Dr. Adrienne Minerick, Michigan Technological University; Dr. Elizabeth G. Jones, University of Nebraska - Lincoln; Dr. Matthew W. Ohland, Purdue University at West Lafayette

Description:

Academic leaders at the program director level and higher from various institutions will share their perspectives, insights, and advice to inform and assist individuals interested in learning about the general processes and procedures for academic promotion, achieving tenure, and building a research portfolio in support of academic advancement.

Goals:

To capture advice and insights from seasoned academic professionals on the subject of tenure, and professional-track faculty advancement and success.

Questions such as the following will be entertained:

• Advice for junior faculty as they start their academic career

• What does a successful first year look like?

• Major mistakes made by junior faculty

• Advice for professional-track faculty

• Balance between work (research, teaching, service) and life

**F433 - Pre-College Engineering Education Division Session II**

1:00 P.M. - 1:30 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Pre-College Engineering Education Division

Moderators: Andrea Burrows, University of Wyoming; Bradley Bowen, Virginia Polytechnic Institute and State University

Members of the Materials Division will share in-class or online activities/demos used to teach topics in materials science. Participants will describe or show an activity/demo and discuss facilitation and student feedback. Presentations will be approximately 5-10 minutes each, followed by group discussion.

**F436 - Activities with Impact**

2:00 P.M. - 3:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Materials Division

Moderators: Lessa Grunenfelder, University of Southern California; Alison Polasik, Ohio State University

Members of the Materials Division will share in-class or online activities/demos used to teach topics in materials science. Participants will describe or show an activity/demo and discuss facilitation and student feedback. Presentations will be approximately 5-10 minutes each, followed by group discussion.

**F440A - MIND Business Meeting**

2:00 P.M. - 3:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Minorities in Engineering Division

Annual business meeting for the Minorities in Engineering Division. Election results to be shared.

**F450 - TYCD Business Meeting**

2:00 P.M. - 3:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Two-Year College Division

Two-Year College Division annual business meeting

**F452 - Community Engagement Division Business Meeting**

2:00 P.M. - 3:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Community Engagement 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 any new business.
F457 - Effective Design of Faculty Development Workshop for Equity-mindset and Inclusion

2:00 P.M. - 3:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Faculty Development Division

Moderators: Daniel Galvan, California State University, Los Angeles; Stephanie Cutler, Pennsylvania State University; Jianyu Dong, California State University, Los Angeles

Speakers: Dr. Daniel Galvan, California State University, Los Angeles; Jane Dong; Dr. Lizabeth T. Schlemer P.E., California Polytechnic State University, San Luis Obispo

Background:

The Teaching and Learning Academy (TLA) has been offered at California State University, Los Angeles through the College of Engineering, Computer Science, and Technology for five years. This university is a predominantly Latina university in a large metropolitan area. Many engineering students come from under-served high schools and the faculty often express a frustration with the level of their academic preparation. As part of an effort to help our faculty meet the students where they are, TLA provided a summer workshop focusing on equity and asset-based mindsets, as well as strategies to enhance student learning by leveraging their strengths. TLA also includes monthly gatherings throughout the academic year with the participants in order to build a community and a culture of innovation in Engineering Education. The TLA workshop received overwhelmingly positive feedback from the faculty participants because of the following elements: 1) inclusive design of the workshop for Math, Science and Engineering faculty and professional advisors who can offer broad and diverse perspectives of students’ learning characteristics; 2) reflective and interactive activities that resonate with the participants’ own educational experiences; and 3) demonstration of teaching strategies using Yosso’s Cultural Wealth Model.

Purpose:

Our proposed special session will show how the workshop was designed and conducted by a “demonstration.” Participants will gain direct experience with an engaging workshop that helps faculty rethink their own models of instruction through deep reflection and begin to shift from a deficit orientation of students to one of assets. At the end of the special session, the participants will achieve the following learning goals:

1) Develop a good understanding of effective strategies in designing a faculty development workshop on a topic that could be controversial

2) Gain knowledge about Yosso’s Community Cultural Wealth Model and experience activities that help to bridge the cultural gap between faculty and Latina students

3) Gain insights/ideas of reflective and interactive activities that can be implemented in the participants’ own institution.

F460A - Accreditation Activities Committee

2:00 P.M. - 3:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: ASEE Headquarters

Accreditation Activities Committee

F460B - Joint ASEE EDC Diversity and Data Committee Meeting

2:00 P.M. - 3:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: ASEE Headquarters

Joint meeting of the EDC Diversity and EDC Data Committees to discuss collaborations.

F460C - External Session Please See Description - ASEE 2021 Program Chair Orientation

2:00 P.M. - 3:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: ASEE Headquarters

This meeting will take place separately from the ASEE Virtual Conference. New and current program chairs will be contacted directly with meeting details.

F466 - INDUSTRY DAY: Preparing Students for Transformative Technology

1:00 P.M. - 1:30 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: Corporate Member Council

Moderators: David Pistrui, University of Detroit Mercy; PJ Boardman, MathWorks

Mega-trends like Artificial Intelligence, Internet of Things, and 5G will change profoundly the way future engineers apply theory to applications like Industry 4.0, autonomous vehicles and health care. How will educators adapt engineering curricula to prepare students for areas that were science fiction but a decade ago?

Join a panel of educators, policymakers and industrial leaders to see how they recommend enhancing engineering curricula to address the needs of future innovators.
F477 - Expanding Resources that Connect Diversity, Equity, Access, and Inclusion with Ethics Education

2:00 P.M. - 3:00 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsors: ASEE Commission on Diversity, Equity & Inclusion; Engineering Ethics Division; Liberal Education/Engineering & Society Division; Engineering Technology Council; Minorities in Engineering Division

Moderators: Elizabeth Cady, National Academy of Engineering; Jean Sanders, North Carolina State University at Raleigh

Speakers: Dr. Rosalyn W. Berne, National Academy of Engineering; Prof. Rebecca A Bates, Minnesota State University, Mankato; Dr. Michael C. Loui, University of Illinois at Urbana - Champaign

Formally connecting ethics to issues of diversity, equity, and inclusion has value, particularly in supporting how engineering programs consider assessment of new ABET Student Outcomes 4 and 5. Outcome 5 includes the phrase, “create a collaborative and inclusive environment.” Without the ability to do this, it is very difficult to achieve ethical design outcomes because diverse perspectives and voices may be excluded.

The goal of this session is to collaboratively consider the intersection of engineering ethical responsibility and the values of diversity, equity, access, and inclusion. The Online Ethics Center (OEC), a digital library maintained by the National Academy of Engineering's Center for Engineering Ethics and Society and funded by the National Science Foundation, contains resources that support ethics education and assessment across STEM fields. Unfortunately, most engineering cases on the OEC address “traditional” ethical issues about product failure and conflicts of interest. This session will provide a framework to develop materials that broadly support engineering education practitioners in teaching and practicing ethics from a diversity, equity, access, and inclusion perspective.

OEC’s challenge is how to engage diverse audiences in use of the site; something formatted evaluation shows has not yet been done sufficiently. The most recently NSF funded OEC project Transforming Ethics Education: Connecting STEM Faculty, Research Administrators, and Ethics Education Resources through the Online Ethics Center, aims to engage two new audiences for the site: RCR (responsible conduct of research) administrators and STEM faculty new to teaching ethics. Specific program goals include reaching diverse audiences within those two groups, in addition to the general and ongoing use of the site by students and faculty. Other goals include drawing in an international audience and expanding resources that are relevant to these audiences.

Many of the OEC's goals align with the vision of the Commission on Diversity, Equity, and Inclusion. However, these goals have been challenging to achieve with limited resources. Searches for the following key words or phrases among the engineering resources on the OEC site returned only two relevant resources: Diversity (one bibliography resource); equity, inclusion, access (multiple hits for access to data, but none related to accessibility in design or access to education); and social impact, disability (one case study on addressing a learning disability in a lab).

Along with the goals that can support the professional development of session participants in connecting diversity issues with ethics, this session aims to have a space where underrepresented groups and people with expertise in DEI are explicitly invited to support the ethical development of engineers by creating awareness of the need for additional resources and familiarity with the processes for contributing resources. This is one way to expand the community of practice related to ethics training within engineering and to further the Commission’s long-term goals of creating a more equitable field and more equitable academic experiences for all prospective engineers.

The format of the session will be a combination of interactive workshop and roundtable discussion, with the bulk of idea generation in the form of small group discussions based on participants' interests and experiences.

Potential working groups include:

- Positive cases where diverse perspectives are included
- Negative cases where diverse perspectives are excluded
- User-centered design
- Social justice actions by engineers
- Social impact of engineering designs
- Climate and culture within engineering education
- Climate and culture within engineering industry
- Hiring practices within engineering education and/or industry
- Recruitment of diverse perspectives for engineering design

Note that participants are likely to translate these suggestions into topics that resonate with them and will find innovative ways of moving forward in this space.

F479 - ABET SESSION: ABET Conducts Remote Program Accreditation Reviews in 2020 - 2021

1:00 P.M. - 1:30 P.M., ONLINE, A VIRTUAL CONFERENCE

Sponsor: ABET Sponsored Sessions

Moderator: Tom Walker,

Speakers: Dr. Joseph L. Sussman, ABET; Ms. Jane Emmet, ABET

This session will summarize how best to address ABET accreditation within the context of academic program response to the novel coronavirus COVID-19 pandemic.

ABET’s Chief Accreditation Officer, Dr. Joe Sussman, and Senior Director of Accreditation Operations, Jane Emmet, will discuss modifications to ABET operations and how these modifications will affect program reviews, acknowledging the current delivery changes to academic programs that have affected teaching and learning.

In addition, Dr. Sussman and Ms. Emmet will answer questions regarding how best to prepare for ABET accreditation given the current status of
This session will summarize recent updates, and we especially encourage participation from programs with ABET visits planned for Fall 2020. Please bring your ABET leaders to this session.

**F501 - ASEE Aerospace Division Business Meeting**
3:00 P.M. - 4:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Aerospace Division
ASEE Aerospace Division Business Meeting

**F508 - Computer-based Testing Facility (CBTF)**
3:00 P.M. - 4:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Computers in Education Division
Moderators: Afrin Naz, West Virginia University Institute of Technology; Walter Schilling, Milwaukee School of Engineering

The Computer-based Testing Facility (CBTF) has been operating at Illinois for over five years and was highlighted by our recent ABET visit as a novel facility that other (large) engineering colleges should know about. It is a pair of computer labs that we proctor 12 hours each day, seven days a week. Students make reservations within a three-day period to take sophisticated, randomized computer-based exams. This fall semester, we’re projecting that we’ll run 75,000 exams to 8,600 unique students serving 35 of the largest courses in Engineering and Computer Science.

We would present: (1) An overview of the facility and its philosophy; (2) salient details related to question/exam construction, security, testing accommodations, and cost; (3) findings from pseudo-experimental research studies that demonstrate improved student course performance; and (4) faculty experiences using the CBTF. The session will summarize and synthesize the findings from a series of previous conference and journal publications.

**F514 - FIE Planning Committee Meeting**
3:00 P.M. - 4:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Educational Research and Methods Division

**F516 - ECCD Business Meeting**
3:00 P.M. - 4:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Energy Conversion and Conservation Division
This meeting is to discuss ECCD matters with the officers and members.

**F541 - Multidisciplinary Engineering Division Business Meeting**
3:00 P.M. - 4:00 P.M., ONLINE, A VIRTUAL CONFERENCE, TBA
Sponsor: Multidisciplinary Engineering Division
Get involved in the MULTI Division. The business meeting is open to all interested ASEE members.

**F545 - Executive Business Meeting**
3:00 P.M. - 4:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Physics and Physics Division
Meeting of Engineering Physics and Physics Division officers to discuss ongoing matters of interest.

**F560A - Equity, Culture & Social Justice in Education Constituent Committee**
3:00 P.M. - 4:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: ASEE Headquarters

**F560B - ASEE Projects Board Meeting**
3:00 P.M. - 4:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: ASEE Headquarters

**F560C - ASEE New Division & Section Officers Orientation - External Session**
3:00 P.M. - 4:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: ASEE Headquarters
This meeting will take place separately from the ASEE Virtual conference. New Division officers will be contacted directly with meeting details.

**F569 - ERC Board Meeting**
3:00 P.M. - 4:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Research Council
Board Meeting of the Engineering Research Council.
F577 - Equity and Inclusion Advocacy: Diversity, Equity, and Inclusion 300
3:00 P.M. - 4:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: ASEE Commission on Diversity, Equity & Inclusion
Moderators: Bruce Neville, Texas A&M University; Elizabeth Litzler, University of Washington; Lynn Albers, Hofstra University; Andrea Haverkamp, Oregon State University
Speakers: Prof. Bruce Neville, Texas A&M University; Dr. Meagan C. Pollock, Engineer Inclusion

This participant-focused session is for individuals who have already begun significant self and organizational work to grapple with concepts like diversity, equity, inclusion, and privilege, and perhaps have begun to interrogate how dominant systems operate within our culture (engineering and larger) to maintain power structures. To be DEI advocates, we must also form a community with the ability to talk about DEI issues. To empower and equip those who wish to take a more active role in advocating DEI within their spheres of influence, the focus of this session will be for participants to engage in deeper conversations based on their own needs and experiences.

F605 - Open Mic Session
4:00 P.M. - 5:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Chemical Engineering Division
Moderator: Matthew Cooper, North Carolina State University at Raleigh

F614 - FIE Steering Committee: Open Session
4:00 P.M. - 5:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Educational Research and Methods Division

F622 - EMD Business Meeting
4:00 P.M. - 5:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Management Division

Business meeting of the Engineering Management Division

F623 - Journal of Engineering Technology Board Meeting
4:00 P.M. - 5:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Technology Division

Summer meeting of the JET publications board.

F639 - Mechanics Division Business Meeting
4:00 P.M. - 5:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Mechanics Division

F642 - New Engineering Educators Division Business Meeting
4:00 P.M. - 5:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: New Engineering Educators Division

Please join us as we decide on the future and direction of our New Engineering Educators Division.

F645 - Business meeting
4:00 P.M. - 5:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Engineering Physics and Physics Division

Engineering Physics and Physics general business meeting.

F646 - Software Engineering Division Business Meeting
4:00 P.M. - 5:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: Software Engineering Division

This business meeting is open to all ASEE members interested in software engineering. We will elect officers for any vacancies, obtain feedback about the conference, and plan next year's conference.

F660A - JEE Editorial Board Meeting
4:00 P.M. - 5:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: ASEE Headquarters
F660B - Advances in Engineering Education Editorial Board Meeting
4:00 P.M. - 5:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: ASEE Headquarters

W758 - PRESIDENT'S FAREWELL RECEPTION and Passing of the Gavel
5:00 P.M. - 6:00 P.M., ONLINE, A VIRTUAL CONFERENCE
Sponsor: ASEE Board of Directors

Join us as we say goodbye to ASEE President Stephanie Adams and welcome President-Elect Sheryl Sorby.
**ABET Sponsored Sessions**

M479  ABET Session: ABET Conducts Remote Program Accreditation Reviews in 2020 - 2021

W479  ABET Criteria and Opportunities for Inclusion in Engineering Education

R479  ABET Session: Making an Impact on STEM Education - Become an ABET Program Evaluator!

F479  ABET SESSION: ABET Conducts Remote Program Accreditation Reviews in 2020 - 2021

**ASEE Board of Directors**

S158A  ASEE Finance Committee Meeting

S158B  ASEE Executive Committee Meeting

S158F  Zone Chair Meeting

S158D  ASEE Nominating Committee

S158E  ASEE Board of Directors Commission on P-12 Engineering Education Business Meeting

U158A  2019/2020 ASEE Board meeting

M258  Welcome Session

M458  MONDAY Keynote Live Question and Answer

M658  ASEE Finance Town Hall & General Body Meeting

T458  TUESDAY Keynote Live Question and Answer

W458B  2020/2021 Nominating Committee - by Invitation Only

W458A  DISTINGUISHED LECTURE: 2019 Best PIC, Zone, and Diversity Papers Live Q&A

W558  ASEE New Board Members Orientation - by Invite Only

W758  PRESIDENT'S FAREWELL RECEPTION and Passing of the Gavel

M158  2020/2021 ASEE Board Meeting

**ASEE Commission on Diversity, Equity & Inclusion**

F777  LGBTQ+ and Allies Virtual Reception - This event will be held outside the Virtual Conference

M417  The Engineer of 2020: Realizing the Vision?

T577C  Do You See Me?: Hypervisible Invisibility #EngineeringWhileBlack

T577B  Safe Zone Level 1

W477A  ASEE CDEI Best Diversity, Equity, & Inclusion Paper Award Finalist Presentations

W477B  DISTINGUISHED LECTURE: Indigeneering Engineering Education: Welcoming Indigenous Knowledge and Wisdom with Integrity

W577C  Equity and Inclusion Advocacy: Diversity, Equity, and Inclusion 100

W577B  Safe Zone Level 2

R477A  Equity and Inclusion Advocacy: Diversity, Equity, and Inclusion 200

R577  Safe Zone Level 3: Deep Dive

R677  Inclusive Practices for Implementing Collaborative Learning in Large Classes

R677B  CDEI Round Table Conversations on Diversity, Equity, and Inclusion

F477  Expanding Resources that Connect Diversity, Equity, Access, and Inclusion with Ethics Education

F577  Equity and Inclusion Advocacy: Diversity, Equity, and Inclusion 300
### ASEE Headquarters

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<td>M560A</td>
<td>GREET THE STARS AND ASEE 101! New Members Orientation and How to Get Involved with ASEE</td>
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<td>W201</td>
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<td>W401</td>
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### Biological and Agricultural Engineering Division

- **W203** Biological and Agricultural Engineering Division Technical Session 1
- **W503** BAE Division Business Meeting
- **R203** Biological and Agricultural Engineering Division Technical Session 2

### Biomedical Engineering Division

- **M204** Educational Interventions and Pedagogy in Biomedical Engineering - June 22nd
- **M304** Teaching Interventions in Biomedical Engineering (Works in Progress) - June 22nd
- **T204** Intro to Biomedical Engineering and Vertically Integrated Curriculum (Works in Progress) - June 23rd
- **T304** Biomedical Engineers and Professional Development - June 23rd
- **T504** Biomedical Engineering Division Business Meeting
- **T704** BME Division Awards Virtual Social
- **W204** Biomedical Engineering Curriculum and Design - June 24th
- **W304A** Design in Biomedical Engineering (Works in Progress) - June 24th
- **W304B** Laboratory Learning in Biomedical Engineering (Works in Progress) - June 24th
- **R204** Introduction to the Field of Biomedical Engineering - June 25th
- **R404** BME Design in the COVID-19 Era and How to Share Your Findings
- **R604** Diversity, Equity, and Inclusion in Biomedical Engineering: Best Practices and Future Directions

### Campus Representatives

- **W763** Campus Reps Reception & Awards Ceremony
- **R563** Campus Rep Business Meeting

### Chemical Engineering Division

- **M205** Chemical Engineering in K-12 and the First Year
- **T205** Course Design, Course Projects, and Student Perceptions in Chemical Engineering
- **T305** Work in Progress: Assessment, Evaluation, and Hands-on Activities
- **T505** CHED Executive Board Meeting
- **W305A** Chemical Engineering in the Sophomore Year
- **W305B** Chemical Engineering in the Junior and Senior Year
- **R405** CHED Business Meeting
- **F205A** Work in Progress: Hands-on Activities
- **F305** Perceptions, Reflections, Collaborations, and Student Support in Chemical Engineering
- **F605** Open Mic Session

### Civil Engineering Division

- **M206A** Inquiry, Inclusivity, and Integration
- **M206B** Perceptions, Projects, and Practical Approaches
- **M306A** Before the Capstone: Project-based Experiences Early in the Curriculum
- **M306B** Beyond the Capstone: Integrating Authentic Experiences that Promote Learning and Excitement
- **T206** Key Educational & Professional Issues of Strategic Importance to the Civil Engineering Profession - and ASCE - Part 1
T306  Key Educational & Professional Issues of Strategic Importance to the Civil Engineering Profession - and ASCE - Part 2

T506  Best in 5 Minutes: Demonstrating Interactive Teaching Activities

T706  Civil Engineering Division Annual Awards Banquet

W206A  Star Tech: Bringing Data Science and Technologies into the Classroom

W206B  Integrating Sustainability and Resilience Concepts into Courses

W306A  Making it Sticky: Ways to Reinforce Prerequisite Knowledge

W306B  Flipped, Blended, Online, Oh My

W411B  DISTINGUISHED LECTURE: Continued Conversation - Social Disruption of Emerging Technologies and Implications for Engineering Education

R206  Are You Experienced? Approaches and Tools for Experiential Learning

R306  Making Professionals: Methods to Build Success Skills

R506  Civil Engineering Division Planning Meeting

R606  Civil Engineering Division Business Meeting

F206  High-impact Learning Practices

F306  Around the Water Cooler: Ideas and Issues in Civil Engineering Education

R507  CIPD Business Meeting

Community Engagement Division

M352  Community Engagement Division Technical Session 1

T252  Community Engagement Division Technical Session 6

T352A  Community Engagement Division Technical Session 7

T352B  Community Engagement Division Technical Session 5

W352  Community Engagement Division Technical Session 2

W411B  DISTINGUISHED LECTURE: Continued Conversation - Social Disruption of Emerging Technologies and Implications for Engineering Education

W752  Celebration of Engagement: Community Engagement Division Social

F252  Community Engagement Division Technical Session 3

F352  Community Engagement Division Technical Session 4

F452  Community Engagement Division Business Meeting

Computers in Education Division

M208  Computers in Education Division Technical Session 1: Topics Related to Engineering

M308  Computers in Education Division Technical Session 2: Teaching and Learning

T208  Computers in Education Division Technical Session 9: Pedagogical Tools

T308  Computers in Education Division Technical Session 3: Digital Learning Part I

T508  CoED Division Business Meeting

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<td>F208 Computers in Education Division Technical Session 8: Modulus Topics</td>
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| M330A Computing and Information Technology Division Technical Session 1 |      | |
| M330B Computing and Information Technology Division Technical Session 2 |      | |
| T330A Computing and Information Technology Division Technical Session 9 |      | |
| T330B Computing and Information Technology Division Technical Session 3 |      | |
| W330 Computing and Information Technology Division Technical Session 4 |      | |
| W448 The Many Facets of Cyber- and Systems-security Engineering Education |      | |
| R230 Computing and Information Technology Division Technical Session 5 |      | |
| R330A Computing and Information Technology Division Technical Session 6 |      | |
| R330B Computing and Information Technology Division Technical Session 7 |      | |
| R430 Computing and Information Technology Business Meeting |      | |

### Construction Engineering Division

| M202 Architectural Engineering Division Technical Session 1 |      | |
| M302 Architectural Engineering Division Technical Session 2 |      | |
| T202 Architectural Engineering Division Technical Session 3 |      | |
| W209 Construction Engineering Division Technical Session 2 |      | |
| W709 Construction Division Social - canceled |      | |
| R309A Construction Engineering Division Technical Session 4 |      | |
| R309B Construction Engineering Division Technical Session 5 |      | |
| R409 Construction Engineering Division Business Meeting |      | |
| R509 Round Table 1 - COVID in the Spring |      | |
| R609 Round Table 2 - COVID-19 in the Fall |      | |

### Continuing Professional Development Division

| W510 CPDD Executive Board Meeting |      | |
| R310A CPDD Session 1 - Generating Intellectual Excitement for Professional Learners |      | |
| R310B CPDD Session 2 - Professional Development - Where Are We Going? |      | |
| R510 CPDD Executive Board Meeting |      | |
### Cooperative and Experiential Education Division

**M211** Cooperative and Experiential Education Division Technical Session 4 - Innovating Engineering Education through Industry and Community Partnerships, Maker Spaces, Competitions, Research Initiatives, and Experiential Education

**M311** Cooperative and Experiential Education Division Technical Session 2 - Development, Assessment, and Impact of Experiential Education

**M411** Joint Panel: Innovating Engineering Education to Transform the Future

**M417** The Engineer of 2020: Realizing the Vision?

**T411A** Joint Panel: Moving Engineering Forward with Micro-Mobility

**T411B** Joint Panel: Developing a Talent Pipeline through Cooperative/Experiential Education in Applied Research

**W311** Cooperative and Experiential Education Division Technical Session 1 - Skill and Competency Development through the Co-op Experience

**W411A** Joint Panel: Leveraging Experiential Education to Become an International Engineering Education Leader

**W411B** DISTINGUISHED LECTURE: Continued Conversation - Social Disruption of Emerging Technologies and Implications for Engineering Education

**R411** Joint Panel: Leveraging Experiential Education to Become an Engineering Education Leader

**R711** ASEE-CEED Social

**F211** Cooperative and Experiential Education Division Technical Session 3 - Co-op Recruitment and Factors Affecting Success

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### Corporate Member Council

**W766** INDUSTRY DAY: CMC and CIPD Virtual Kick-off

**R466A** INDUSTRY DAY: Hearing from Diverse Voices from the Classroom

**R466B** Corporate Member Council - Board Meeting

**F466** INDUSTRY DAY: Preparing Students for Transformative Technology

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### Council of Sections

**T567A** PNW Section Mixer

**T567B** Zone I Business Meeting

**T567C** Zone II Business Meeting

**T567D** Zone III Business Meeting

**T567E** Zone IV Business Meeting

**T567F** Council of Sections Meeting

**W567** Best Zone Paper

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### Design in Engineering Education Division

**M213A** Capstone Design Practices

**M213B** Design Methodologies 1

**M313A** Capstone Pedagogy

**M313B** Design Methodologies 2

**T213A** Maker Spaces in Design Education

**T213B** Design Mental Frameworks

**T313A** Best In DEED

**T513** DEED Business Meeting

**W213A** Design Across Curriculum 1

**W213B** Empathy and Human-Centered Design 1

**W313A** Design Across the Curriculum 2

**W313B** Design Teams 1

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Schedule subject to change. Please go to www.asee20.pathable.co for up-to-date information
W313C  Empathy and Human-Centered Design 2
W313D  Design Teams 2
W448   The Many Facets of Cyber- and Systems-security Engineering Education
R313A  Design in K-12 Education
F413   DEED Panel

T614A  VIRTUAL WORKSHOP: Using Power, Privilege, and Intersectionality as Lenses to Understand our Experiences and Begin to Disrupt and Dismantle Oppressive Structures Within Academia
T614B  VIRTUAL WORKSHOP: Advancing Learning through Curricula Design and Enactment Utilizing the Engineering Learning Framework

W214A  Team Facilitation and Effectiveness
W214B  Data-informed Approaches to Understanding Student Experiences and Outcomes
W314A  Experiences of Underrepresented Students in Engineering
W314B  Student Motivation, Identity, and Resilience
W314C  Approaches to Assessment and Student Reflection
W314D  Understanding Student Behavior and Experiences
W414   DISTINGUISHED LECTURE: Talking the Talk and Walking the Walk: How Our Publications Reflect the Engineering Education Community
W714   ERM Annual Community Celebration & Awards Reception (Formerly the ERM Brouhaha)

M214A  Student Experiences with Undergraduate Research
M214B  Student Perceptions of Self-efficacy, Success, and Identity
M214C  Faculty and Student Perspective on Instructional Strategies
M314A  Alternatives to Traditional Assessment
M314B  Care and Inclusive Teaching
M314C  Teaching Assistants, Supplemental Instruction, and Classroom Support
T214A  Teaching and Learning in Online Environments
T214B  Postgraduate Pathways and Experiences
T314A  Sense of Belonging and Diversity in Engineering Programs, Courses, and Teams
T314B  Instruments and Methods for Studying Student Experiences and Outcomes
T414   Research on Engineering Practice: Catalyzing the Next Generation of Scholars
T547   ERM Community Welcome Session
T514   ERM Business Meeting

R314A  Approaches to Curriculum and Policy
R314B  Degree Pathways and Cocurricular Experiences
R314C  Collaboration and Communication in Problem-based Learning
R314D  Student Approaches to Problem Solving
R314E  Educational Research and Methods Division (ERM) Best Paper Finalists
F214A  Engineering Education Research Practices and Community
F214B  Graduate Education Expectations, Preparation, and Pathways
F214C  Perspectives and Evaluation of Engineering Design Education
ASEE’S VIRTUAL CONFERENCE
SPONSOR GROUPS

F314A  K-12 and Bridge Experiences in Engineering Education
F314B  Cognitive Skills Development
F314C  Approaches to Encouraging Student Engagement
F414  FIE Steering Committee: Executive Session
F514  FIE Planning Committee Meeting
F614  FIE Steering Committee: Open Session

**Electrical and Computer Division**

M215A  Curricular Advancements in ECE
M315B  Insights for Teaching ECE Courses
M315  Assessment of Learning in ECE Courses
M415  PANEL: Research from NSF RED ECE Departments
M451  Managing Dual Careers
T215  Capstone, Undergraduate Research, and Projects in ECE
T315  Embedded Systems and Cybersecurity in ECE
W215  Improvements in ECE Circuit Analysis
W315  Course Transformation in ECE
W448  The Many Facets of Cyber- and Systems-security Engineering Education
W715  ECE Division Networking Social
R315A  New Developments in ECE
R315B  Active and Cooperative Learning in ECE
F215  New ECE Laboratories
F415  ECE Division Business Meeting

**Energy Conversion and Conservation Division**

M216  ECCD - Technical Session 1 - Energy & Electrical Engineering
M416  Innovations in Energy, Environment, and Engineering Education
T216  ECCD - Technical Session 2 - Solar Energy
T316  ECCD Technical Session 3: Energy and Multidisciplinary
T335  Green Energy Manufacturing and Sustainable Energy Management
T416  ECC and Manufacturing Divisions - NSF Guest Speaker Session
W216  ECCD Technical Session 4: Energy and Analysis
W316  ECCD Technical Session 5: Energy and Wind and Design
W416  DISTINGUISHED LECTURE: Smart Energy: Opportunities and Challenges
W716  Virtual Tour - Energy Facilities
R716  Social: Energy Conversion & Conservation Division and Manufacturing Division
F216  ECCD - Technical Session 6 - Energy & Thermodynamics
F416  The Latest Research and Pedagogy in Energy Conversion and Conservation
F516  ECCD Business Meeting

**Engineering Deans Council**

W568A  EDC Public Policy Committee Meeting
W568B  EDC Executive Board Meeting
R668  EDC Business Meeting

**Engineering Design Graphics Division**

M218  Engineering Design Graphics Division Technical Session 4
M417  The Engineer of 2020: Realizing the Vision?
T318  Engineering Design Graphics Division Technical Session 1
T518  EDGD Executive Committee Meeting
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<td>F320</td>
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W411B DISTINGUISHED LECTURE: Continued Conversation - Social Disruption of Emerging Technologies and Implications for Engineering Education
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M425 Innovative Development for Various Faculty Lines
T325 A Focus on Sustainability
T506 Best in 5 Minutes: Demonstrating Interactive Teaching Activities
W225 Inventive Opportunities for Research and Exposure
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**Experimentation and Laboratory-oriented Studies Division**

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**Faculty Development Division**

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- M326 Experimentation and Laboratory-oriented Studies Division Technical Session 6
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**First-Year Programs Division**

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- M324 ENT Division Technical Session: First-year Experiences
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- T327B First-year Programs: Student Perceptions and Perspectives
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- T527 FYEE Steering Committee Meeting
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- W227 The Best of First-Year Programs Division
- W327 First-year Programs: Professional Development and Skills
- W527 First-Year Programs Officers Meeting
- W577C Equity and Inclusion Advocacy: Diversity, Equity, and Inclusion 100
- W577B Safe Zone Level 2
- R227A First-year Programs: Focus on Students
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Schedule subject to change. Please go to www.asee20.pathable.co for up-to-date information
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R327B  First-Year Programs: Design in the First Year  
R327C  First-Year Programs: Metacognition, Self-Efficacy, and Motivation #1  
R327D  First-Year Programs: Peer Mentoring  
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R677  Inclusive Practices for Implementing Collaborative Learning in Large Classes  
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Industrial Engineering Division

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R332B  Factors Influencing Curriculum Development: International Division Technical Session 4  
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T328A  Preparation for Graduate Research  
T628  VIRTUAL WORKSHOP: Advising Graduate Students: Lessons Learned from the Dissertation Institute  
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- **M334B** Minoritization Processes and Critical Responses
- **T234** Novel Strategies for Studying Liberal Education
- **T334A** Technical Courses and Liberal Education
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- **W234** Promoting Communication Skills
- **W334** Relationships Between Skills and Knowledge Domains
- **W477B** DISTINGUISHED LECTURE: Indigeneering Engineering Education: Welcoming Indigenous Knowledge and Wisdom with Integrity
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- **R335A** Learning Strategies
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- **W536** Materials Division Meeting
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- **F436** Activities with Impact

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- **M337B** Mathematics Division Technical Session 5: From Functions to Big Data–A Hands-on Challenge
- **T337** Mathematics Division Technical Session 1: Best Practices in Engineering Math Education
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- **T638** VIRTUAL WORKSHOP: Advancing Mechanical Engineering Education Through Mobile Learning Micro-Workshop Training
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- **W338B** Mechanical Engineering Technical Session: Dynamics II - Feel the Vibe
- **W338C** Mechanical Engineering Technical Session: Capstone and Design
- **W416** DISTINGUISHED LECTURE: Smart Energy: Opportunities and Challenges

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- **M339B** Assessment Strategies in Mechanics
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- **T339** Grading and Feedback Models in Mechanics
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R542  Jump-start Your Grant Search: Help in Identifying and Applying for NSF Sponsored Grants  
R642B  Pathways into Engineering Education Research: Where Do I Get Started?  
R642A  Rx for Active Learning Success  
R742  NEE Division Networking Social  
F342  New Engineering Educators 3 - Grading: Grate or Great  
F642  New Engineering Educators Division Business Meeting

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**Ocean and Marine Division**

M417  The Engineer of 2020: Realizing the Vision?  
T344  Ocean and Marine Engineering Division: Best Paper Technical Session  
W416  DISTINGUISHED LECTURE: Smart Energy: Opportunities and Challenges  
W544  Ocean and Marine Engineering Division Business Meeting  
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**Pre-College Engineering Education Division**

M333A  Pre-college Engineering Education Division Technical Session 1  
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M333C  Pre-college Engineering Education Division Technical Session 3  
M333D  Pre-college Engineering Education Division Technical Session 19  
M333E  Pre-college Engineering Education Division Technical Session 4  
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**New Engineering Educators Division**

M342  New Engineering Educators 4: Tips and Tools  
W342  New Engineering Educators 1: Learning Aids  
W542  How Should I Teach? Perspectives and Discussions on What Works for Your Peers in an Engineering Classroom
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<td>W448</td>
<td>The Many Facets of Cyber- and Systems-security Engineering Education</td>
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<tr>
<td>W411B</td>
<td>DISTINGUISHED LECTURE: Continued Conversation - Social Disruption of Emerging Technologies and Implications for Engineering Education</td>
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<td>SPONSOR TECHNICAL SESSION: Assessments in the Online Engineering Classroom - Presented by Wiley</td>
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<td>SPONSOR TECHNICAL SESSION: Get Your Simple-to-Use TI-RSLK MAX Robot Fully Built, Tested, and Ready for Learning in Under 20 Minutes - Presented by Texas Instruments</td>
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<td>VIRTUAL WORKSHOP: Redshirting in Engineering: A Model for Supporting Student Success in Engineering</td>
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<td>VIRTUAL WORKSHOP: Partnering with the Engineering for Us All (E4USA) Advanced High School Course: Next Steps for All Stakeholders</td>
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<td>VIRTUAL WORKSHOP: How to Identify Appropriate NSF Funding Programs and Prepare Competitive NSF Engineering Education Research Proposals</td>
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<tr>
<td>W299A</td>
<td>SPONSOR TECHNICAL SESSION: Integrating Coordinate Metrology into Engineering Programs - Presented by ZEISS Industrial Quality Solutions</td>
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<tr>
<td>W399B</td>
<td>SPONSOR TECHNICAL SESSION: Innovation in Engineering Education – Fusing Electromagnetic Simulations with Theory and Experiments in Antenna and Wireless Communication Courses - Presented by Altair</td>
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<tr>
<td>W399C</td>
<td>SPONSOR TECHNICAL SESSION: Hands-on, Project-based Learning with Digital Twins for Mechatronics in Engineering Education and Research - Presented by Altair</td>
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<td>SPONSOR TECHNICAL SESSION: How to Implement Online Hands-on Classes During the Time of COVID-19 - Presented by STMicroelectronics</td>
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<td>VIRTUAL WORKSHOP: Mixed Reality in Engineering Education: How Does it Affect User Experience, Motivation, and Student Performance?</td>
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<td>VIRTUAL WORKSHOP: A Phasor Toolbox for AC Circuit Analysis using MATLAB</td>
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ASEE’S VIRTUAL CONFERENCE
SPONSOR GROUPS

#ASEEVC

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W699M VIRTUAL WORKSHOP: Applying for an NSF CAREER Award? Research-based Workshop to Support Early Career Faculty

W699N VIRTUAL WORKSHOP: Curriculum and Course Design for Mechatronics and Robotics Engineering Education

W699O VIRTUAL WORKSHOP: Reverse-engineering YouTube Videos to Develop Course Content

W699P VIRTUAL WORKSHOP: Technology Enhanced Active Learning - for Busy Skeptics and True Believers

W699Q VIRTUAL WORKSHOP: Reframing and Reimagining the Experiences of Doctoral Women of Color in Engineering


W699T VIRTUAL WORKSHOP: Massification of Open-ended, Project-based Design Teaching for Any Class Size

T547 ERM Community Welcome Session

T747 Student Division Social

W447 How to be a Graduate Student - Before We Forget

W547 Student Division Business Meeting


F247 Student Division Technical Session 3

Systems Engineering Division

M348 Systems Engineering Division Technical Session 1

T248 Systems Engineering Division Technical Session 2

W448 The Many Facets of Cyber- and Systems-security Engineering Education

W548 SED Business Meeting

R319 Engineering Economy Division Technical Session 1

R729 Joint Divisions Social Event

Technological and Engineering Literacy/Philosophy of Engineering Division

M349 Developing Technological Literacy in Students

M417 The Engineer of 2020: Realizing the Vision?

T249 Exploration of Broad Issues and Promotion of Engineering and Technological Literacy

W349 Curriculum Development in Technological Literacy

W549 TELPhE Division Business Meeting

Student Division

M347 Student Division Technical Session 1

T247 Student Division Technical Session 2

T347A Student Division Technical Session 4

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Schedule subject to change. Please go to www.asee20.pathable.co for up-to-date information
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<td>W350A</td>
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<td>R451</td>
<td>Computing -- Increasing Participation of Women and Underrepresented Minorities</td>
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<td>R378</td>
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<td>Ms. Alya Abd Aziz</td>
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<td>Alaa Abdalla</td>
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<td>Rohini Abhyankar</td>
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<td>Prof. Jeremiah T. Abiate</td>
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<td>Sabia Zehra Abidi</td>
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