



**2023 ASEE IL-IN Section Conference**

April 1, 2023

Edwardsville, IL

**SOUTHERN ILLINOIS UNIVERSITY  
EDWARDSVILLE**



## SCHEDULE OVERVIEW

8:30 - 8:45	<p>Welcome</p> <p>Chris Gordon, Conference Chair</p> <p>Doug Tougaw, ASEE President-Elect</p>		
9:00 - 10:00	<p>Paper Session 1</p> <p>Diversity, Equity, and Inclusion in STEM Education and Outreach</p> <p>Session Chair: Amardeep Kaur</p>	<p>Paper Session 2</p> <p>Best practices in outreach, retention, and the first-year experience</p> <p>Session Chair: Chris Gordon</p>	<p>Workshop (60 minutes)</p> <p>Rethinking Engineering Course Design Using a Human-Centered Engineering Design Framework</p>
10:15 – 11:15	<p>Paper Session 3</p> <p>Beyond Boundaries: Exploring the Intersection of Access, Pedagogy, and Technology in Engineering Education</p> <p>Session Chair: Sinan Onal</p>	<p>Paper Session 4</p> <p>Innovations in STEM Education: Strategies for Sustainable and Transformative Learning</p> <p>Session Chair: Saad Ullah</p>	
11:30 – 12:30	Poster Session and Lunch		
12:45 – 1:30	<p>Paper Session 5</p> <p>Labs and Experiential Learning</p> <p>Session Chair: Ralph Tayeh</p>	<p>Paper Session 6</p> <p>Pedagogy and assessment</p> <p>Session Chair: Keqin Gu</p>	<p>Workshop (45 minutes)</p> <p>Improving Course Outcomes and why accessibility matters: How to add ClassTranscribe to your course</p>
1:45 – 2:30	Section Business Meeting		
2:30 – 4:00	Keynote and Awards		

## SCHEDULE AT A GLANCE

8:30 - 8:45 AM	Welcome
8:45 - 9:00 AM	Break
9:00 - 10:00 AM	<b>SESSION 1</b> -Paper Sessions 1 & 2, Workshop 1
10:00 - 10:15 AM	Break
10:15 - 11:15 AM	<b>SESSION 2</b> -Paper Sessions 3 & 4
11:30 - 12:30 PM	Lunch and Poster Session
12:45 - 1:30 PM	<b>SESSION 3</b> - Paper Session 5 & 6, Workshop 2
1:45 - 2:30 PM	Section Business Meeting
2:30 - 2:45 PM	Break
2:45 - 4:00 PM	Keynote and Awards

## **WORKSHOP SCHEDULE (Workshops will be held in EB 1170)**

### **9:00 – 10am – Rethinking Engineering Course Design Using a Human-Centered Engineering Design Framework**

**Saadeddine Shehab, Taylor Tucker, and Alexander Pagano (University of Illinois at Urbana-Champaign)**

Human-centered design (HCD) has been an important player in the future direction of engineering education. HCD offers a promising approach to both promote situated learning in engineering design projects and facilitate students' learning of modern engineering skills. However, it can be challenging to integrate HCD within established engineering courses due to competing objectives and limited instructional time. Furthermore, without guidance or training, engineering faculty may find it nebulous to connect HCD outcomes to their own course learning objectives or performance indicators. Thus, the integration of human-centered design and engineering (i.e., human-centered engineering design, or HCED) should leverage HCD approaches and mindsets to promote student learning of practical engineering design skills in a manner that is cohesive with the constraints and learning curves that engineering faculty face.

To provide support in learning about and applying human-centered design, we developed an evidence-based human-centered engineering design framework that connects HCD mindsets and other pertinent learning metrics (such as ABET outcomes and KEEN framework elements) to engineering design activities. Faculty members can use the framework as a tool to facilitate their thought processes and strategies regarding evaluating existing courses, identifying opportunity areas for incorporating HCED elements, developing new HCED-related course learning objectives, defining students' performance indicators, and connecting objectives and indicators to ABET's student learning outcomes. They can also employ the framework to assist in visualizing learning trajectories, which may be helpful for developing assessment tools and making organizational changes. In this workshop, we will present the framework and lead participants in applying it to their own courses as shown in Table 1. We will encourage participants to bring course syllabi and guide them in using the framework to identify opportunity areas within their course.

### **12:45 -1:30pm Improving Course Outcomes and why accessibility matters: How to add ClassTranscribe to your course**

**Lawrence Angrave (University of Illinois Urbana-Champaign)**

ClassTranscribe - "Netflix for learning" - is an open-source system developed and used by engineering faculty and students at the University of Illinois Urbana-Champaign. ClassTranscribe improves learning for all students and provides an accessible interface to help make courses more inclusive. In this workshop you can learn how we're using it in U of I courses to improve engineering education, how you can provide videos with accurate captions (using best-in-class a combination of automated and crowd sourcing techniques), and how accessibility features helps students succeed. You'll also learn to use the latest features that can turn your lecture video content into equivalent course notes, including latex, html, pdfs and epub formats.

This session will allow participants to explore the student and instructor interface of ClassTranscribe, including creating books and "I-Notes" from lecture videos. Workshop attendees will be able to use ClassTranscribe (<https://ClassTranscribe.illinois.edu>) in their own courses. Attendees will need access to a browser (laptop or tablet with internet access) to access the ClassTranscribe website.

## DETAILED SCHEDULE

### SESSION 1: 9:00 – 10:00am

#### Paper Session 1: Diversity, Equity, and Inclusion in STEM Education and Outreach

Location: Engineering Building 1033

Session Chair: Amardeep Kaur

9:00 – 9:15am	Factors that Influence the Pursuit of Collegiate Aviation Maintenance Degree Programs: The Differences Between Women and Men Students Ashley Habig and Caroline Marete (Purdue University)
9:15 – 9:30am	Connecting motivations for graduate school with learning experiences of engineering undergraduates: A gender perspective Hsinju Chen, Mayura Kulkarni, Alyssa Huang, Mei-Yun Lin, Roland D. Cusick, Holly M. Golecki (University of Illinois Urbana-Champaign)
9:30 – 9:45am	Characterizing the Educational Effectiveness of STEM Demonstrations at Science-focused Events for Adult Audiences Tom Lucas (Purdue University)
9:45 – 10:00am	Feasibility of Using the CAPE Framework to Identify Gaps in Equity-focused CS Education Research Joey Reyes (Knox College & CSEdResearch.org), Monica M. McGill (CSEdResearch.org)

**SESSION 1: 9:00 – 10:00am**

**Paper Session 2: Best practices in outreach, retention, and the first-year experience**

Location: Engineering Building 1150

Session Chair: Chris Gordon

9:00 – 9:15am	Work-in-Progress: Partnerships to Create Opportunity through Informal Learning Kristin Giglietti, H. Rex Gaskins, Marcia Pool (University of Illinois Urbana-Champaign)
9:15 – 9:30am	Engineering Technology Students' Perceptions of a Transformed Gateway Course Rustin Webster, Matthew Turner, Brittany Newell (Purdue University)
9:30 – 9:45am	Work-In-Progress: An Updated Peer Mentorship Strategy for First Year Engineering Benjamin D. McPheron (Anderson University)
9:45 – 10:00am	Effect of Connected Courses on Student Retention in the First year Curriculum Chris Gordon (Southern Illinois University Edwardsville)

**SESSION 1: 9:00 – 10:00am**

**Workshop 1: Rethinking Engineering Course Design Using a Human-Centered Engineering Design Framework**

Location: Engineering Building 1170

Saadeddine Shehab, Taylor Tucker, and Alexander Pagano (University of Illinois at Urbana-Champaign)

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engineering design skills in a manner that is cohesive with the constraints and learning curves that engineering faculty face.

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**SESSION 2: 10:15 – 11:15 am**

**Paper Session 3: Beyond Boundaries: Exploring the Intersection of Access, Pedagogy, and Technology in Engineering Education**

Location: Engineering Building 1033

Session Chair: Sinan Onal

10:15 – 10:30am	Transitioning between a flipped civil engineering classroom and fully online learning: Lessons learned before, during, and after the COVID-19 Pandemic Ryan Fries and Chaya Gopalan (Southern Illinois University Edwardsville), Ravali Vennu, (Bechtel)
10:30 – 10:45am	System Design, Evaluation and Applications of Domain Term Extraction from Engineering Videos Jiaxi Li, Ninghan Zhong, Rob Kooper, Lawrence Angrave (University of Illinois Urbana-Champaign)
10:45 – 11:00am	Exploring the Potential Benefits and Risks of ChatGPT in Engineering Education Sinan Onal (Southern Illinois University Edwardsville)
11:00 – 11:15am	Improving Access to Engineering Education: Unlocking Text and Table Data in Images and Videos Uchekukwu Uche-Ike, Lawrence Angrave (University of Illinois at Urbana Champaign)

**SESSION 2: 10:15 – 11:15 am**

**Paper Session 4: Innovations in STEM Education: Strategies for Sustainable and Transformative Learning**

Location: Engineering Building 1150

Session Chair: Saad Ullah

10:15 – 10:30am	Building a Sustainable Institutional Structure to Support STEM Scholars – Scholar Survey Data D. W. Mueller, Jr, Josué Njock Libii, Donna D. Holland, O. David Momoh, Peter A. Ng, Reynaldo M. Pablo (Purdue University Fort Wayne), Suleiman Ashur (Eastern Michigan University)
10:30 – 10:45am	Work-in-Progress: Sustainability Education in Law and Engineering Tyler J. Smith (Bradley University)
10:45 – 11:00am	Curricular Priority and Transformation of Construction Engineering Capstone Design Course Brandon Fulk, Kyubyung Kang (Purdue University)
11:00 – 11:15am	Work-In-Progress: Can We Create a Model Program: Insights into the Effectiveness of a Research Experience for Undergraduates La’Tonia Stiner-Jones (The Ohio State University)



## POSTER SESSION 11:30 -12:30

Location: Engineering Building Atrium

The Global STEAM Academy – a conduct to promote STEM and Computational Thinking to non-privileged communities in the USA and Latin America through remote learning Corresponding author: Marcelo Caplan (Columbia College Chicago)
Work-in-Progress: Gamification of Security Education Corresponding author: Minh Duong (University of Illinois – Urbana Champaign)
Examining student career social capital using the Mentoring Social Capital Instrument Corresponding author: Adrian Gentry (Purdue University)
Work-in-Progress: The development and impact of digital notes on students with and without disabilities in engineering and computing courses Corresponding author: Noah Gersich (University of Illinois – Urbana Champaign)
Applications of Piezoelectric Materials in Sports Corresponding author: Najmus Saqib (University of Indianapolis)
Case Study of Adaptions of Concept Mapping in a Multidiscipline Engineering Course Corresponding author: Victoria Shao (University of Illinois – Urbana Champaign)
Analyzing accuracy of Word Error Rates (WER) of Artificial Intelligence (AI) generated captions compared to professional human generated captions in engineering lecture videos Corresponding author: Jessica Singh (University of Illinois – Urbana Champaign)
Undergraduate Student led Laboratory Development Corresponding author: Narango Tumor (Southern Illinois University Edwardsville)
Work-in-Progress: Understanding the needs of engineering and STEM students with disabilities Corresponding author: Sujit Vardahan (University of Illinois – Urbana Champaign)
Work In Progress: Advances in an Augmented Reality Accessible Technology Project for Engineering Education Corresponding author: Yun (Tiger) Wang (University of Illinois – Urbana Champaign)

### SESSION 3: 12:45 – 1:30 pm

#### Paper Session 5: Labs and Experiential Learning

Location: Engineering Building 1033

Session Chair: Ralph Tayeh

12:45 – 1:00pm	The Development of Low-Cost Programmable Logic Controller Labs for a Control Systems Course Benjamin D. McPheron, Devin J. Goodrich Michael Q. Mullinix (Anderson University)
1:00 – 1:15pm	A Hands-on Activity on Human-Powered Lights For a Lab Experiment and In-Class Demonstration Purno Ghosh, Frances Harackiewicz, Omer Elsanusi (Southern Illinois University Carbondale)
1:15 – 1:30pm	Work in Progress: Work in Progress: A Simple Plug-in Implementation of Extreme Audio Stretching Ethan Laptew, Yufeng Lu (Bradley University)

### SESSION 3: 12:45 – 1:30 pm

#### Paper Session 6: Pedagogy and assessment

Location: Engineering Building 1150

Session Chair: Keqin Gu

12:45 – 1:00pm	Using Concept Maps in an Undergraduate Heat Transfer Course Najmus Saqib (University of Indianapolis)
1:00 – 1:15pm	Specifications Grading in Undergraduate Fluid Mechanics Julie Mendez (Indiana University-Purdue University Columbus)
1:15 – 1:30pm	Using Design Review in the Classroom Thomas J. Dobrowski (Purdue Northwest)

### SESSION 3: 12:45 – 1:30 pm

#### **Workshop 2: Improving Course Outcomes and why accessibility matters: How to add ClassTranscribe to your course**

**Lawrence Angrave (University of Illinois Urbana-Champaign)**

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### **SECTION BUSINESS MEETING, KEYNOTE AND AWARDS: 1:45 – 4pm**

Location: EB 1033

**Remarks:** ASEE President-Elect Doug Tougaw, dean of the College of Engineering at Valparaiso

**Keynote Address:** “Green Ink, Great Gobs of Points, & Good Grades” by Dr. Robert Stwally III (Purdue University), 2022 recipient of the ASEE IL-IN Section Outstanding Teaching Award.

**Awards:** Best Paper, Best Diversity, Equity, and Inclusion Paper, 2023 Outstanding Teacher, 2022 Outstanding Campus Representative

# MAPS

<https://www.siu.edu/maps/?keyword=engineering-building>

Free Parking (weekends) in Lot B



# ENGINEERING BUILDING

