2025 ASEE North Central Section Conference

2025 ASEE North Central Section Conference

CONFERENCE AGENDA

Huntington, WV
Saturday, March 29th, 2025
https://www.marshall.edu/asee-ncs-2025/

Friday, March 28th

5 to 8 p.m.	Welcome Reception & Registration (WAEC Mian Lobby)
6:30 to 8 p.m.	Executive Board meeting (WAEC 3101-B)

Saturday, March 29th

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8 to 8:45 am.	Registration & light continental breakfast (WAEC 2nd floor lobby)
8:45 to 10:00 am.	**Session 1**
10 to 10:15 am.	Session break-1
10 to 11:30 am	**Poster setup (WAEC 2nd-floor lobby)**
10:15 to 11:30 am.	**Session 2**
11:30 to 11:40 am	Session break-2
11:40 to 12:40 pm.	**Poster Session 2nd Floor lobby**
12:40 to 2:00 pm.	Lunch & Keynote Speaker (WAEC 1201)
2:25 to 3:30 pm.	**Session 3**
3:30 to 3:45 p.m.	Session break-4
3:45 to 5:00 p.m.	**Session 4**
5 to 5:30 p.m.	Session Break-5
5:30 to 7:00 p.m.	Dinner & Award Ceremony (Memorial Student Center)

PC - Contacts

Haroon Malik: malikh@marhall.edu

David Dampier: dampierd@marshall.edu

Driving Directions

[From Double Tree Conference recommended Hotel to Arthur Weisberg Family Applied Complex (**WAEC**)- 3 min drive & 16 min walk]

MARSHALL UNIVERSITY HUNTINGTON CAMPUS
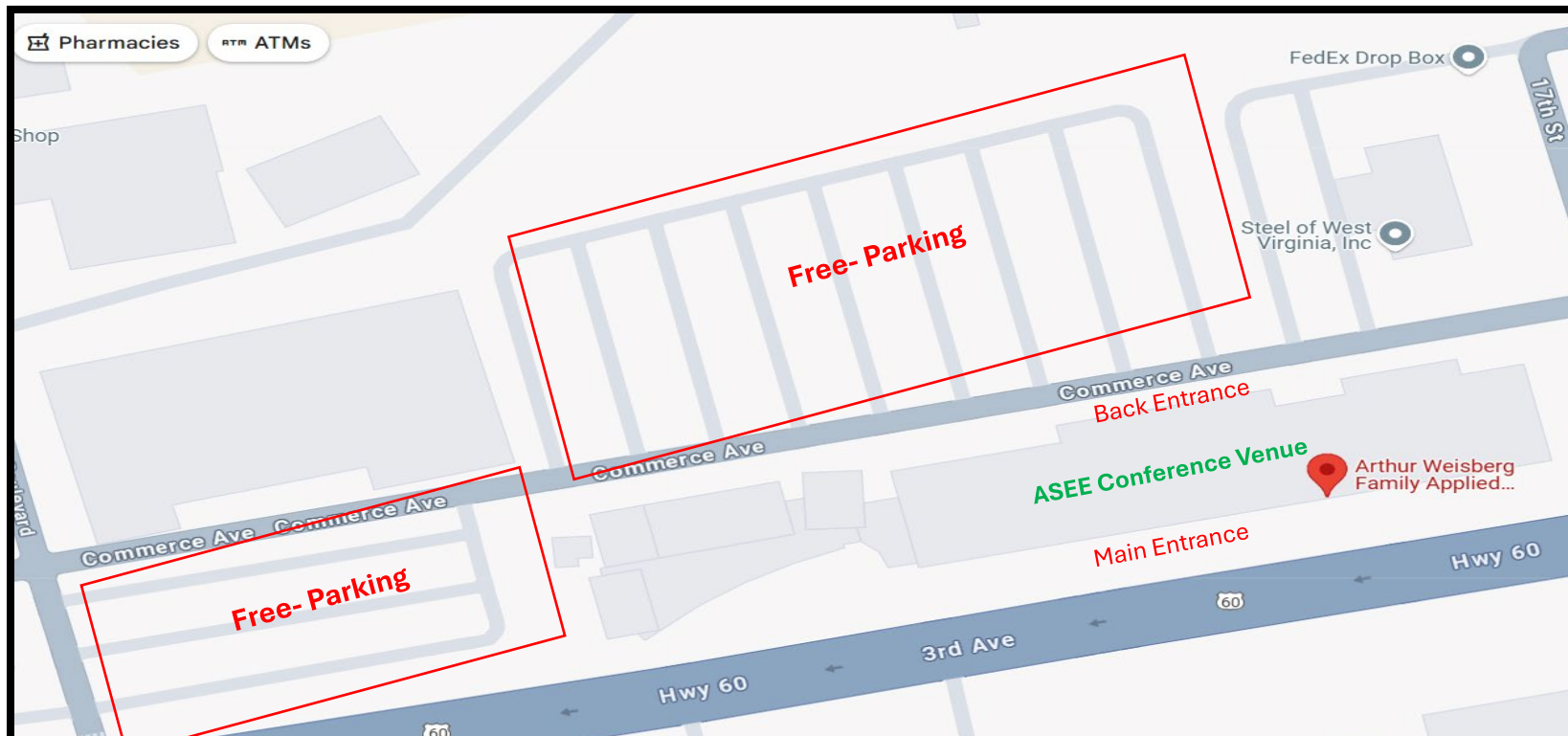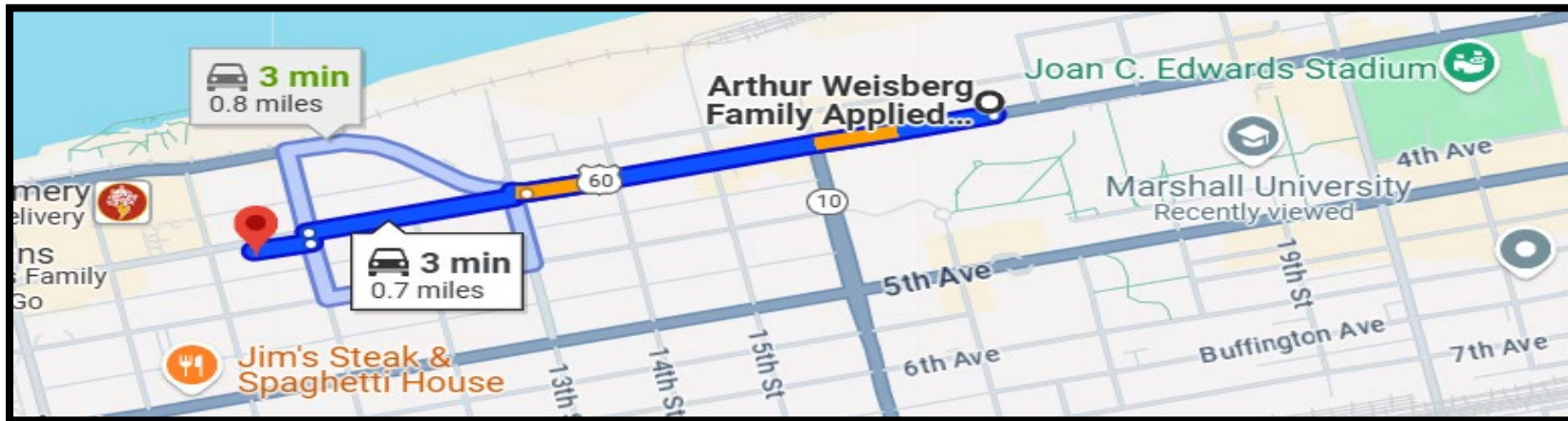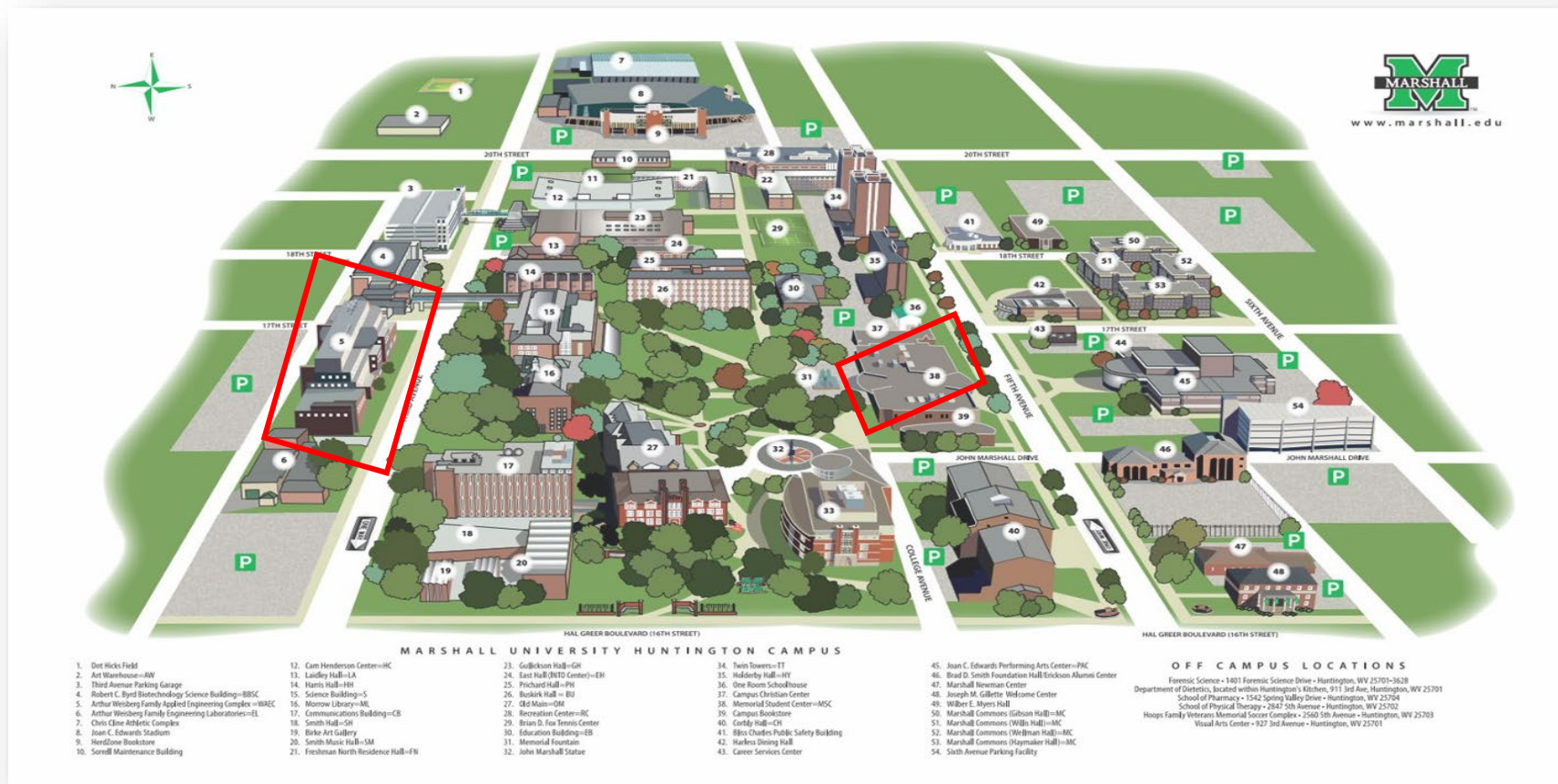
Building-5: Conference Venue

Building-38: Dinner and Award Ceremony (Student Memorial Center- Don Morris Room)

Campus Interactive Map: https://www.marshall.edu/map/

2025 ASEE North Central Section Conference

Presentation Schedule

Huntington, WV

Saturday, March 29th, 2025

Internet access is available through eduroam. Participants can use their institution's credentials to log into Marshall University eduroam for internet access. Marshall University's Division of Information Technology has partnered with eduroam, a secure, worldwide roaming Internet access service developed for the international research and education communities. More information at: https://www.marshall.edu/it/services/researchcomputing/eduroam/

To ensure a smooth and efficient session, we highly recommend bringing your presentation **on a USB drive** for easy transfer to the podium computer at the start of the session. This will help maximize session time and minimize technical disruptions. If you prefer to use your own device, please ensure you bring in the corresponding HDMI connector/cable.

PAPER PRESENTATIONS

Session 1-A: 8:45-10:00 AM – **[Room 1201]**

Paper ID	Paper Title	Author
49496	What Do You Want to Know About Me?" Student Questions About Their Professor	Diane Peters
49533	EngineerFEST: Building Community and Engagement Among First-Year Engineering Students	Susie Huggins
49582	Advancing WiFi-based Imaging: An Approach for Real-Time Object Detection and Classification	Ramakrishnan Sundaram
49546	Improving the use of online resources to enhance efficiency of the Problem-Based Learning in Engineering Education	Alan Hoback
49758	Work in Progress: A two-way learning street: Near-peer college students enhance high school after-school STEM club opportunities	Ernest Cartwright

Each presenter will have a 15-minute time slot, including 2–3 minutes for Q&A. Please plan your presentation accordingly.

Session 1-B: 8:45-10:00 AM – [Room 1205]

Paper ID	Paper Title	Author
49761	Bridging Tradition and Innovation: A Thoughtful Approach to Future-Ready Education	Ragavanantham Shanmugam
49762	Structured Pathways for Student Success: A Strategic Approach to Course Optimization and Academic Excellence	Ragavanantham Shanmugam
49469	Inclusion of Sustainability into a First-Year Engineering Technology Course	Punya Basnayaka
49436	Feasibility and Effectiveness of Online Learning for Engineering Students at Marshall University in the Post-Pandemic Era	Yousef Fazea
49763	Mindset Matters: Exploring Grit and Attitudes in Engineering and CS Undergrads in an NSF S-STEM funded program.	Tina Cartwright

Session 1-C: 8:45-10:00 AM – [Room 1203]

Paper ID	Paper Title	Author
49478	Reinforcement Learning with Human Experience (RLHE) for Racing Car Games	Jundong Liu
49488	West Virginia's Power Systems Industry: History, Directions, and Future	Alexa Hoffman
49489	A Literature Review of Transdisciplinarity in Engineering Education	Shuyu Wang
49505	Gamification in Power System Education	Edward Sizemore
49516	Random Walk Modeling and Simulation Analysis of Coal Fly Ash Compounds Settling in West Virginia	Jarod Banzon
49532	Predictive Modelling of a Continuously Variable Transmission for Optimal Performance	Kathryn Chludzinski

Session 2-A: 10:15-11:30 AM- [Room 1201]

Paper ID	Paper Title	Author
49561	Evaluating the Impact of a Summer NSF REU Program on Undergraduate Students' STEM Career Aspirations and Educational Goals: A Case Study	Sudipta Chowdhury
49466	Development of Next Generation Column Guard - Final Phase of a Multi-Year Senior Capstone Project	Robert Michael
49630	Tuition Equity: Adverse effects of tuition policy on engineering students	Nicholas Baine

Each presenter will have a 15-minute time slot, including 2-3 minutes for Q&A. Please plan your presentation accordingly.

| 49600 | Designing and Developing Summer K-12 STEM Outreach Programs Through a Tenure-Track Faculty's Perspective | Nathan Galinsky |
| 49598 | Experiences Piloting a Program for Implementing High Impact Practices with Limited Resources | Rick Hill |

Session 2-B: 10:15-11:30 AM- Room [1205]

Paper ID	Paper Title	Author
49483	Student-Driven Design of a Lift System for EOD Equipment Handling	Yousef Sardahi
49484	Student Learning Through Engineering Design: Developing a Safe Recoil Indication System for Military Applications	Yousef Sardahi
49518	Engaging Undergraduate Students in Solving Real Roadway Problems at the Campus of the Islamic University of Madinah	Aiman Kuzmar
49626	Exploring Open Lab Experiences to Enhance Fluid Mechanics Education	Carmen Cioc
49752	Effect of Injection Molding Parameters on Shrinkage Behavior of Recyclable Polymers	Sumaiya Benta Nasir

Session 2-C: 10:15-11:30 AM- Room [1203]

Paper ID	Paper Title	Author
49537	Slow Moving Vehicle Automation Through an Affordable Retrofit	Kastriot Palokaj
49545	Understanding Electricity Theft: Causes, Consequences, and AI-Based Detection	Ethan Stevenson
49552	Systematic Review of Wind Energy Vehicle Integration	Zach Schreiber
49465	Work-in-Progress: Survey Development to Examine Connections Between Engineering Identity and Engineering Student Support	Leslie Hopkinson
49593	Applications of Computer Vision Segmentation in Hematology and Blood Cell Medical Imaging	Xu Gao

Session 3-A: 2:15-3:30 PM- Room [1201]

Paper ID	Paper Title	Author
49599	Collaborative Outreach to Inspire Interest in Civil and Environmental Engineering Through Stormwater Design using Best Management Practices	Elin Jensen
49750	Comparative Analysis of OpenAI GPT-4o and DeepSeek R1 for Scientific Text Categorization Using Prompt Engineering	Ananya Jana
49612	Implementing a Flipped Learning Approach In Two Engineering Courses	Lynn Dudash

Each presenter will have a 15-minute time slot, including 2–3 minutes for Q&A. Please plan your presentation accordingly.

| 49629 | Determining Effectiveness of Pedagogical Techniques with Ascending Surveys | Mark Palmer |
| 49602 | Analysis of Energy Consumption and Theoretical Assessment of Welding Efficiency in Augmented Reality Arc Welding and Digital Manufacturing | Omar Al-Shebeeb |

Technical Session 3-B: 2:15-3:30 PM - Room [1205]

Paper ID	Paper Title	Author
49542	New Course for Robotics and PLC Control	William Evans
49610	Development of Embedded Technical Writing in a Junior-level Geotechnical Engineering Laboratory Class	James Lynch
49613	Approach to Sustainable Material Selection Balancing Trade-Offs with Ashby Charts	Elin Jensen
49621	Traffic Flow Management of State Street-Bayfront Parkway Intersection: A Simulation Case Study	Junayed Pasha
49437	Improving Statistics Education at Wright State University with Design Project Based Learning, Problem Solving, and Peer Review	Trevor Bihl

Session 3-C: 2:15-3:30 PM- Room [1203]

Paper ID	Paper Title	Author
49603	Academic Advising App	Benjamin Starling
49605	Tag AI-Sandbox	Ramakrishnan Sundaram
49607	Design of a Greeting Robot	Evan Fisher
49614	Work In Progress: Gamified Escape Rooms for Statics	Seyed Mohammad Seyed Ardakani
49616	Robotic Wildfire Detection Using Computer Vision	Preston Sellards

Session 4-A: 3:45-5:00 PM- Room [1201]

Paper ID	Paper Title	Author
49481	Impact of Automation, Robots, and Coding Clubs on the Career Choices of Marginalized Students in STEM Fields	Baqer Aljabr
49751	Evaluating the Suitability of Different Intraoral Scan Resolutions for Deep Learning-Based Tooth Segmentation	Ananya Jana
49534	Spark of Imagination Capstone	Grace Hattery

Each presenter will have a 15-minute time slot, including 2–3 minutes for Q&A. Please plan your presentation accordingly.

| 49597 | A YOLO-Based Semi-Automated Labeling Approach to Improve Fault Detection Efficiency in Railroad Videos | Dylan Lester |
| 49611 | Gesture-Based Drone Control: Enhancing Precision with Code Algorithms | Mathew Allen |

Session 4-B: 3:45-5:00 PM- Room [1203]

Paper ID	Paper Title	Author
49619	Modeling of Optical Sensors Incorporating Optical Amplifiers	Ali Nawaz
49601	Visible simplified microcontroller model for teaching and learning	Brian Krug
49606	PolarBear DSP Digital Effects Pedal	Wesley Hanson
49585	Modeling of Single Muscle Fiber Action Potential With Varying Depth	Edward Sizemore
49569	Office Message Board	Brian Downey

POSTER PRESENTATIONS

Location (WAEC 2nd floor lobby)

Paper ID	Poster Title	Author
49615	Advancing Drone Autonomy: Obstacle Avoidance, 3D Mapping, and Control Strategies for Complex Environments	Ben Taylor
49618	Fanuc Robot Cell Demonstrations	Tyler Dean
49633	Material and Design Optimization of Medical Seals for Steam Sterilizers	Zainab Al Tamimi
49465	Work-in-Progress: Survey Development to Examine Connections Between Engineering Identity and Engineering Student Support	Dr. Leslie Hopkinson
49563	Automated Ebb and Flow Irrigation System for Sustainable Greenhouse Agriculture	Jessica McCracken
49567	Make Engineering in History Alive	WenJuan Mo

Each presenter will have a 15-minute time slot, including 2–3 minutes for Q&A. Please plan your presentation accordingly.

49569	Office Message Board	Brian Downey
49570	Investigating the Factors Limiting High School Girls' Pursuit of STEM: A Review of The Literature	Manar Yamany
49586	3D simulation of saline flow in a mini-osmotic pump: streamlines from membrane to Lynch coil	Joon Shim
49587	Optimizing geometric configurations for turbulence control in mini-osmotic implant design	Joon Shim
49608	Development of a Mechanized Adjustable Stage for Enhanced Efficiency and Safety in Theatre Operations	Yingxiao Song
49620	Amatrol Process Control Teaching System -Development of Process Control Curriculum at WVU Tech	Sihe Zhang
49622	Simulation modeling and analysis of efficiency gains in part number stamping automation	Junayed Pasha
49623	Fitness Center Operational Improvement Through Discrete Simulation	WenJuan Mo
49624	ONU Micromouse	Logan Zetts
49763	Mindset Matters: Exploring Grit and Attitudes in Engineering and CS Undergrads in an NSF S-STEM funded program	Tina Cartwright
49484	Student Learning Through Engineering Design: Developing a Safe Recoil Indication System for Military Applications	Yousef Sardahi
49496	"What do you want to know about me?" Student questions about their professor	Diane L Peters

Poster Setup Instructions

Poster setup begins at 10:00 AM. Please check with the reception desk for directions to the poster setup venue. Dedicated personnel will be available to guide you to the poster setup venue and provide you with an easel number. Each easel will be equipped with a foam board. Kindly attach your poster to the foam board and adjust it as needed. Please do not leave your poster unattended during the poster session, which runs from **11:40 AM to 12:40 PM**. Anonymous judges will visit each poster during this time for award consideration. They may ask you to briefly present your work and respond to questions. You may remove or wrap up your poster around 1:00 PM.

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******APPROVED WORKSHOPS******

Presentation Schedule and Abstracts

Time	Workshop Title	Room
10:15-11:30 AM	Empowering Engineering Educators: Build & Implement a Custom AI Assistant for Student Learning & Engagement.　　Enas Aref	1101
10:15-11:30 AM	Student-Centered Language for a Positive Classroom Climate.　　Ron Reaser	3103-B
2:15-3:30 PM	First2 Network's Guide to Improvement Science Projects to Enhance STEM Education.　　Kimberlyn Gray	1101
3:45-5:00 PM	A Hands-on STEM Enrichment Activity to Promote Engineering to High School Students.　　Qudsia Tahmina	3103-B
3:45-5:00 PM	Inviting the whole-person to the classroom.　　Shehla Arif	1101

Empowering Engineering Educators: Build & Implement a Custom AI Assistant for Student Learning & Engagement
Enas Aref − *Western Michigan University*

Abstract
Artificial intelligence (AI) is transforming higher education, offering new opportunities for student engagement, personalized learning, and instructional efficiency. However, many educators struggle to integrate AI meaningfully while upholding academic integrity and promoting responsible student use. Engineering and technology educators face additional challenges, as AI implementation in these fields requires careful consideration to maximize its potential while mitigating unintended consequences. Research on generative artificial intelligence (Gen AI) in education highlights both its promise and challenges. While tools like ChatGPT are widely used, harnessing AI as an effective learning tool requires an informed and structured approach rather than passive adoption.
This hands-on workshop will guide participants through the creation of custom AI assistants tailored to their course content and instructional goals. Unlike generic AI tools, these assistants provide structured, supervised engagement, helping students develop critical thinking, problem-solving abilities, and AI

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literacy. By embedding AI into the curriculum with clear ethical guidelines, educators can encourage meaningful learning rather than passive reliance on AI-generated content.

Participants will explore how AI assistants can enhance various educational needs, from automating tutoring in engineering concepts to supporting project-based learning and generating interactive simulations. Through a structured, step-by-step process, attendees will design AI assistants aligned with course objectives, tailored to discipline-specific challenges, and capable of providing meaningful feedback to students.

Student-Centered Language for a Positive Classroom Climate

Ron Reaser – Western Virginia University

Abstract

The language an instructor uses in their classroom and curriculum can have a profound impact on the wellbeing of students and their chances for success both within the course and beyond the course. Language which values students by promoting their belonging, engagement, and setup for success can promote a positive classroom climate and measurably increase their motivation and learning, whereas language which devalues students by risking their othering, disengagement, and setup for failure can risk a negative classroom climate and measurably decrease their motivation and their learning.

This workshop offers an overview of student-centered approaches to practicing helpful language, avoiding harmful language, and revising curriculum and communications with student-centered language in mind, based on techniques gleaned from research and advocacy by the Association of College and University Educators, the Inclusive STEM Teaching Project, and the National Effective Teaching Institute.

During the workshop, attendees will discuss how to refactor adversarial language into inviting language in a syllabus or an assignment, how to mitigate the risks of stereotype threat and tokenizing on marginalized students in the classroom or in assignment groups, how to promote healthy question-asking and help-seeking behaviors on the part of students, how to gracefully address the complexity or difficulty of assignments or topics without alienating or discouraging students, and a variety of other techniques for using language in positive ways that can improve student wellbeing and success with little or no effort on the part of the instructor.

First2 Network's Guide to Improvement Science Projects to Enhance STEM Education

Kimberlyn Gray – Western Virginia University

Abstract

The language an instructor uses in their classroom and curriculum can have a profound impact on the wellbeing of students and their chances for success both within the course and beyond the course. Language which values students by promoting their belonging, engagement, and setup for success can promote a positive classroom climate and measurably increase their motivation and learning, whereas language which devalues students by risking their othering, disengagement, and setup for failure can risk a negative classroom climate and measurably decrease their motivation and their learning.

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A Hands-on STEM Enrichment Activity to Promote Engineering to High School Students

Qudsia Tahmina – *The Ohio State University*

Abstract

This workshop discusses an enrichment activity for the career exploration of high school students. It is becoming more important for higher education institutions to partner with local schools to provide a myriad of opportunities for students to explore careers in STEM. Facilitating conversations during early high school about college majors, identifying specific areas of interest, setting career goals and roadmaps and building pathways for successful careers have become critical for student success. Collaborations with local schools to support enrichment and exploration help promote engineering degree programs and attract high school students to college. Due to a lack of understanding of engineering applications in high school, there is a disconnect between the college curriculum and school coursework. Some of the reasons for low enrollment or retention in engineering programs are a lack of alignment in curriculum and differences in expectations of students for learning the concepts and applying those concepts to real-world problems. Students find it difficult to connect mathematical models and scientific principles to real-world engineering problems.

Activities such as summer camps and weekend or weeklong enrichment programs are being envisioned to enhance student learning outside the classroom. These activities provide a platform to help stimulate students' interest in STEM fields and get the students and their parents engaged for prospective college admission. At the regional campus of a very large research institution, activities like summer camps are being offered to attract local students to STEM fields. At this institution, engineering faculty work with undergraduate students to develop hands-on activities to provide an inclusive learning opportunity. As part of the admissions process, students visit campus to learn about the programs offered and explore college majors.

During such college visits, an engineering workshop was offered to 28 high school students. The 90-minute workshop consisted of activities involving building a water irrigation system using a breadboard, Arduino, DC power supply module, water pump with a motor, and capacitive soil moisture sensor. The activity also involved the basic programming of the Arduino microcontroller to set a threshold for soil moisture and turn the motor on and off based on the measurements from the sensor. This activity helped introduce students to basic concepts in electronics, such as circuit theory and computer programming. Students were put in groups of 2 or 3 to facilitate group discussions and brainstorming. The hands-on activity started with a very simple circuit diagram with step-by-step connections. TinkerCad was used to demonstrate the circuit connection and measurements. Students were asked to write a simple C code to read the moisture values from the sensor. After reviewing the basic concepts, students were allowed time to test and troubleshoot their circuits. Funding from industry collaborators will help sustain the program. Most of the participants declared the workshop was extremely interesting or interesting. Teachers were interested in adapting this activity into their curriculum. This collaborative workshop in collaboration with the admissions office increased awareness among students and teachers about engineering applications and what the institutions have to offer.

Inviting the Whole-person to the Classroom

Shehla Arif – *University of Mount Union*

Abstract

Each presenter will have a 15-minute time slot, including 2–3 minutes for Q&A. Please plan your presentation accordingly.

Engineering education is techno-centric despite its aims of serving the society. Engineering faculty spend most of the instruction time on technical content. Engineering students tend to consider engineering education separate from their persons. This is in contrast to several liberal arts fields which explicitly invite the student as a person to their education. This applies to reflexive learning drawing from critical theory. In this workshop, participants will explore the role of reflexivity in the learning process, apply it to engineering contexts, and acquire techniques to encourage students to connect their education with their person. These practices in turn support deeper connections between the learner and the teacher as well as the actor and its environment. Thus, these reflexive practices have the potential to steer engineering more in the direction of serving society.

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