

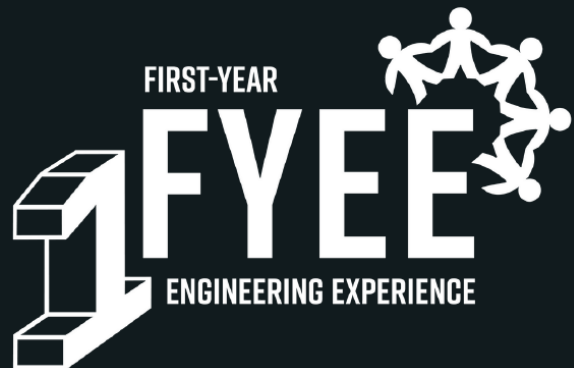


# FYEE 2025

**ENGINEERING COMMUNITIES:  
FOSTERING CONNECTIONS  
FOR FIRST-YEAR SUCCESS**



A. JAMES CLARK  
SCHOOL OF ENGINEERING



July 27-29, 2025

The University of Maryland, College Park



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THINGS TO DO

# WELCOME FROM DEAN SAMUEL GRAHAM, JR.



**SAMUEL GRAHAM, JR.**  
DEAN, A. JAMES CLARK  
SCHOOL OF ENGINEERING,  
UNIVERSITY OF MARYLAND

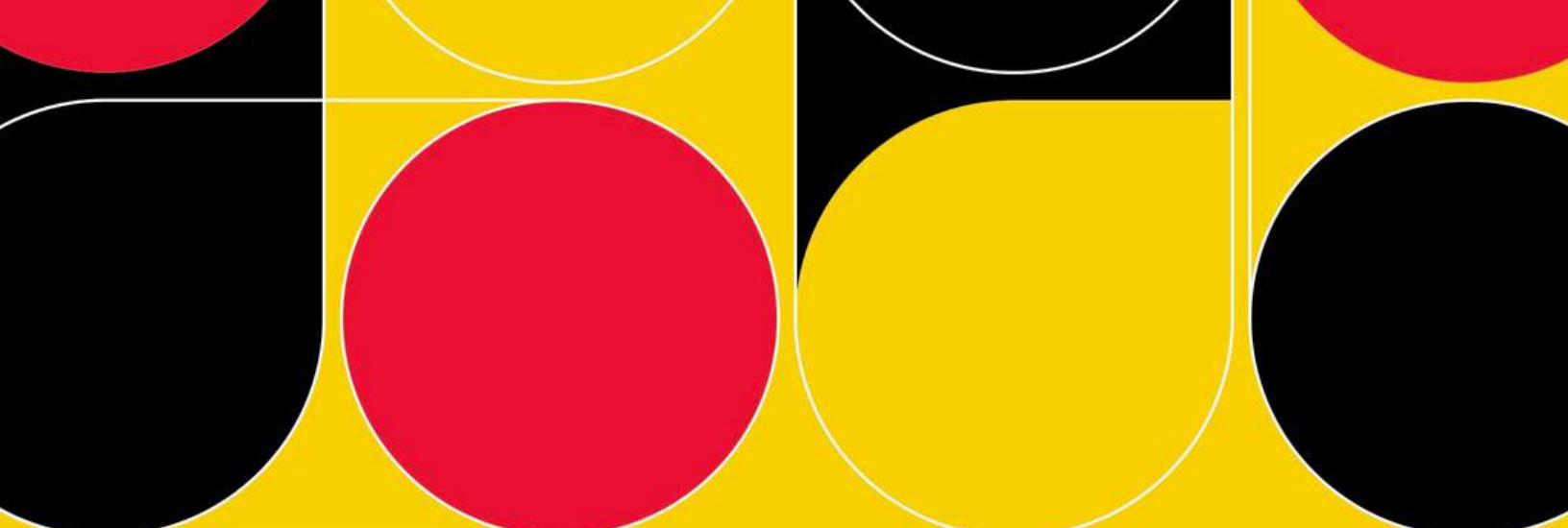
Dear Colleagues,

It is a distinct pleasure to welcome you to the 2025 First-Year Engineering Experience (FYEE) Conference, hosted by the A. James Clark School of Engineering at the University of Maryland. This gathering brings together a vibrant community of educators, researchers, and practitioners dedicated to advancing the success of first-year engineering students.

The FYEE Conference serves as an important forum for sharing innovative practices, research findings, and institutional strategies that strengthen the academic and personal development of students in the earliest stages of their engineering education. As we all know,

the first year of engineering in our academic institutions really sets the stage for both the success and retention of talented students who enroll in our programs each year. As educators and institutional leaders, we understand how foundational the first year is to shaping a student's identity, confidence, and sense of belonging within our programs and enabling them to become early contributors to the engineering profession. Your presence here reflects a shared commitment to that critical mission.





At the Clark School, we take great pride in preparing students not only to succeed in their coursework, but also to contribute meaningfully to addressing the grand challenges of our time. As dean and Nariman Farvardin Professor in the Department of Mechanical Engineering, my own research has focused on developing wide bandgap semiconductor technologies to advance applications in advanced communications and power electronic devices for the efficient use of electric power. My service on federal advisory boards has exposed me to a variety of challenges that have consistently reinforced the need for early-stage student engagement, strong mentorship, and hands-on learning principles to prepare the workforce that will meet the national need. These ideals are central to this conference and to the work you do every day.

We are honored to serve as the host institution for this year's conference and deeply grateful to the FYEE community for your unwavering dedication to student success. I trust that your time at the University of Maryland will be both productive and inspiring.

Thank you for your commitment to shaping the next generation of engineers. We are delighted to welcome you to College Park.

Warm regards,



Samuel Graham, JR.

Dean and Nariman Farvardin Professor





**KEVIN CALABRO**  
CONFERENCE CHAIR,  
UNIVERSITY OF  
MARYLAND



**KATHRYN SCHULTE  
GRAHAME**  
PROGRAM CHAIR,  
NORTHEASTERN  
UNIVERSITY

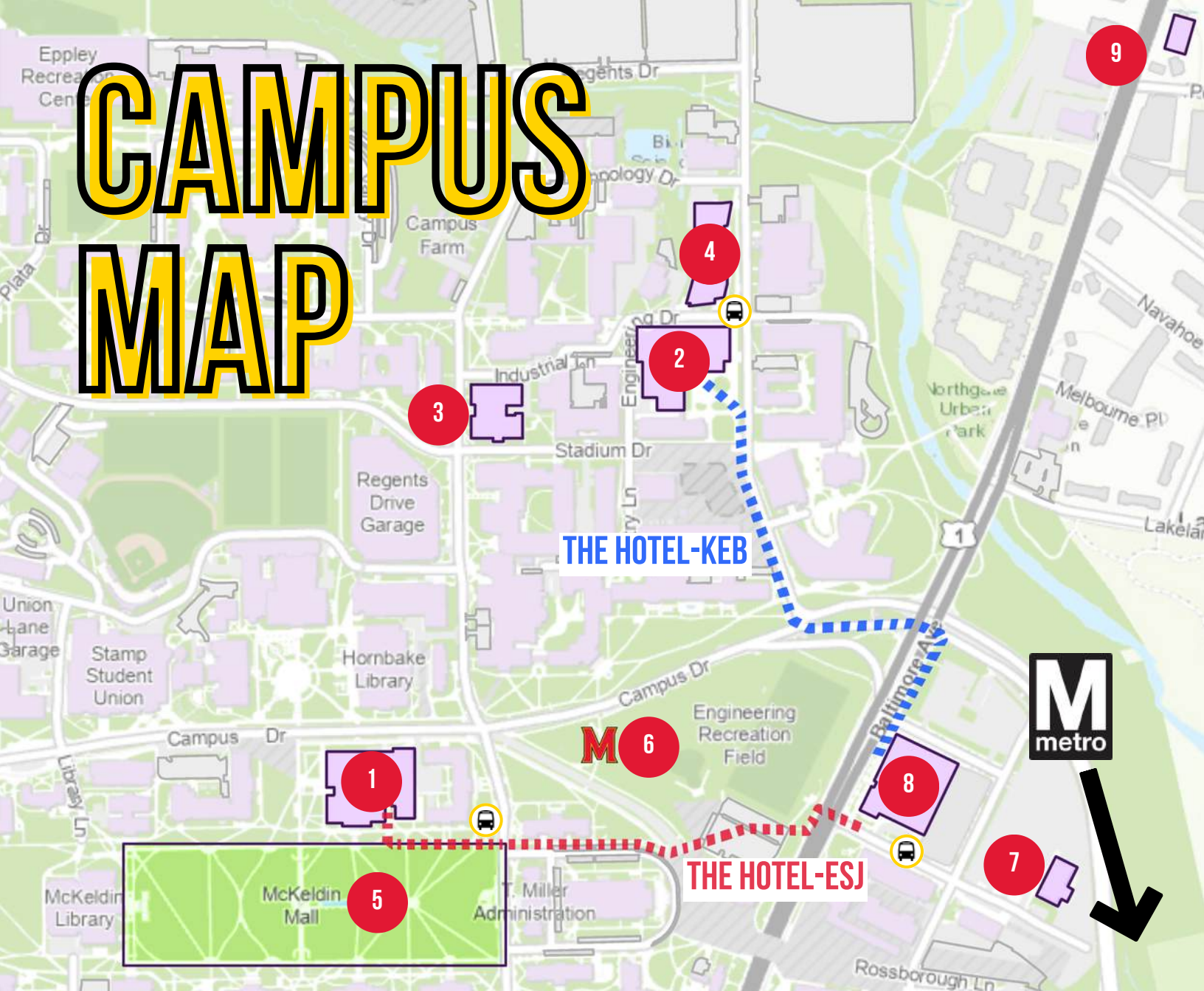
# WELCOME FROM THE GENERAL CHAIRS

**Welcome to the 16th Annual First-Year Engineering Experience Conference (FYEE)!** We are excited to gather in College Park at the University of Maryland to explore the power of *Engineering Communities* and the many ways we can foster connections to ensure our first-year programs and students are successful.

**FYEE 2025** is about forging professional connections and developing actionable strategies that you can take back to your campuses. We hope that you immerse yourself in the interactive sessions, reconnect with existing colleagues at other institutions while expanding your professional network to include attendees you meet for the first time, and freely share your insights and experiences with others in the FYP community. Together, we'll uncover innovative and high-impact approaches to support first-year engineering student success and broaden participation in engineering.

Over the next three days, you'll engage with inspirational keynote speakers, participate in hands-on workshops, gain insights from research findings presented in work-in-progress and full paper technical sessions, and learn about impactful teaching and advising practices through the GIFTS sessions. Our aim is for you to leave inspired, with fresh ideas and a renewed enthusiasm to enhance the engineering experience at your institution. We look forward to your active participation at this year's conference!

# CAMPUS MAP



1

## **Edward St. John Center (ESJ)**

*Monday & Tuesday Sessions*

2

## **Jeong H. Kim Engineering (KEB)**

*Sunday Registration*

3

## **J.M. Patterson Building (JMP)**

*Sunday Sessions*

4

## **A. James Clark Hall (AJC)**

*Sunday Welcome Reception*

5

McKeldin Mall

6

M Circle

7

## **The Hall**

*Monday Keynote Reception*

8

The Hotel at the  
University of Maryland

9

The Cambria Hotel



## **College Park Metro Station**

*104 Shuttle Bus OR*

*20 minute walk from campus*

# SCHEDULE

## KEY

REGISTRATION	SESSION
BREAK/MEAL	SPEAKER

	REGISTRATION	
7:30		
8:00		
9:00	<b>MON, 7/28</b>	<b>TUE, 7/29</b>
	7:30 AM	7:30 AM
10:00	-	-
	12:30 PM	12:30 PM
11:00	<b>ESJ</b>	<b>ESJ</b>
12:00		
1:00	<b>SUN, 7/27</b>	
2:00	12 PM	
3:00	-	
	6 PM	
4:00	<b>KEB</b>	
5:00		

### WHERE DO I REGISTER?

SUNDAY: Kim Rotunda  
 MONDAY: ESJ, Ground Floor  
 TUESDAY: ESJ, Ground Floor

	SUNDAY, JULY 27	
12:00	Orientation & Onboarding (12-1:30 PM)	KEB
1:00	Welcome & Icebreaker (1:30-2 PM)	KEB
2:00	Workshop I (2-3:30 PM)	JMP
3:00	Ice Cream Break (3:30-3:45 PM)	JMP
4:00	Workshop II (3:45-5:15 PM)	JMP
5:00		
6:00	Engineering Tours (5:15-6:30 PM)	JMP, AJC
7:00		
8:00	Welcome Reception (6:30-8:30 PM)	AJC



# AT-A-GLANCE

	MONDAY, JULY 28	
7:30	Breakfast (7:30-8:30 AM)	ESJ
8:00	& Welcome (8:15-8:30 AM)	ESJ
	Keynote I (8:30-9 AM)	ESJ
9:00	Break (9-9:15 AM)	ESJ
	WIP I & WIP II (9:15-10:30 AM)	ESJ
10:00	Break (10:30-10:45 AM)	ESJ
	Workshop III (10:45 AM-12:15 PM)	ESJ
11:00		
12:00		
	Lunch, Group Photo & Exhibits (12:15-1:45 PM)	ESJ
1:00		
	Workshop IV (1:45-3:15 PM)	ESJ
2:00		
3:00	Break (3:15-3:30 PM)	ESJ
	Full Papers I & II (3:30-4:30 PM)	ESJ
4:00		
	Panel I & Panel II (4:30-5:30 PM)	ESJ
5:00		
	Depart ESJ (5:30-6 PM)	ESJ
6:00		
7:00		
8:00	Keynote II, Reception, & Dinner (6-9 PM)	The Hall
9:00		

TUESDAY, JULY 29	
Breakfast (7:30-8:30 AM)	ESJ
GIFTS I & II (8:30-10:30 AM)	ESJ
Break (10:30-10:45 AM)	ESJ
Full Papers III & IV (10:45-11:45 AM)	ESJ
Rapporteurs, Awards, & Closing (12-12:30 PM)	ESJ
Boxed Lunches (12:30-1:30 PM)	ESJ
First-Year Admins Lunch & Optional Tours (1-2:30 PM)	The Loft, ESJ

**SCAN FOR  
ABSTRACTS**



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# DR. DARRYLL J. PINES

## FYEE 2025 KEYNOTE SPEAKER



**DARRYLL J. PINES**  
PRESIDENT, UNIVERSITY OF  
MARYLAND, COLLEGE PARK

**Dr. Darryll J. Pines** is the 34th president of the University of Maryland and a professor of aerospace engineering. Since 2020, he has led initiatives to foster diversity, support student success, and address global challenges through research and collaboration. Key efforts include the Terrapin Commitment for need-based aid, TerrapinSTRONG onboarding, and a pledge for net-zero carbon emissions by 2025. A faculty member since 1995, Pines previously served as engineering dean and is a member of the National Academy of Engineering. He holds degrees from UC Berkeley and MIT.

**Building the Pipeline: e4usa and the Next Generation of Engineers:** Amidst declining enrollments, changing demographics and rising costs, it is more imperative than ever that educators reach the next generation of engineers with experiential programs that have immediate impact and inspire them to continue their academic journey. In this talk, University of Maryland President Darryll J. Pines will discuss how the landscape of engineering education has changed and how his work leading Engineering for US All—a first-of-its-kind, national initiative designed to introduce engineering design principles—is creating new pathways to engage young people and inspire them to deliver real world solutions for our societal challenges.

# AMIR ANSARI

## FYEE 2025 KEYNOTE SPEAKER

**Amir Ansari** is a serial entrepreneur and prolific inventor whose career spans telecommunications, AI, edge computing, personalized healthcare, and multimedia. He co-founded Telecom Technologies, Inc., where, as CTO, he commercialized pioneering Voice-over-IP systems that significantly reduced calling costs and transformed carrier networks in the 1990s. Following its 2001 acquisition by Sonus Networks, he co-founded Prodea Systems, building one of the earliest end-to-end Internet of Things (IoT) platforms for smart homes, elder care solutions, and connected vehicles. Today, Amir is the co-founder and inaugural executive director of the E.A Fernandez IDEA Factory and xFoundry@UMD. This multimillion-dollar initiative blends multi-disciplinary coursework, extensive resources, and annual entrepreneurship competitions that supply capital and mentorship, empowering student teams to launch ventures addressing society's grand challenges. Beyond his ventures, Amir has served on the XPRIZE Foundation's board since 2004 and is a member of its Vision Circle.



**AMIR ANSARI**

CO-FOUNDER & EXEC DIRECTOR,  
IDEA FACTORY, xFoundry@UMD

**Building A Solution Engine Inside Higher Education in the Age of AI:** How can we empower universities to become the “solution engine” for grand challenges, while reimagining learning in the age of AI and investing in and partnering with local communities? xFoundry is a multidisciplinary program that turns universities into innovation engines by combining team-based curriculum, robust resources, and annual entrepreneurship competitions to launch student ventures that tackle real-world challenges.



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# SESSION OVERVIEW

The following pages provide the program schedule for the FYEE 2025 conference. To view the abstracts for any of the presentations, you can scan the QR code below, which will direct you to the abstract repository hosted in Google Docs.

There are four types of presentations given throughout the conference, and the sessions are facilitated so that the conference is engaging and impactful for both authors and audience members. See below for a brief description of each session type.

**WORKSHOP** Workshops encourage interaction between the facilitators and the attendees to help them explore solutions to challenges they face in their programs.

**WIPS** Work-in-progress (WIP) papers share current research and/or implementation that is not yet completed, providing authors the opportunity to engage in discussion with other conference attendees to gain feedback on their work and find potential collaborators.

WIP authors will present a 5-minute 'pitch' to audience members (separated into two rooms), before all participants are invited to discuss WIPs authors' work during a combined poster session.

**FULL PAPER** Full papers authors will present completed work, or work at a phase where results are available for analysis and discussion. Full paper presentations will be 12-minutes or less, with time for questions from the audience following the presentation.

**GIFTS** Great Ideas for Teaching, and Talking with, Students (GIFTS) papers are for authors wanting to share their best practice for teaching, advising and developing first year engineering talent.

GIFTS authors will be split into two rooms and will present a 2-minute 'pitch' to audience members. We will then allow for interactive discussion between the authors and attendees for ~30 minutes ('science-fair' style), before audience members rotate to the second GIFTS session.

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ABSTRACTS**



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TIME	EVENT	ROOM
7:30 - 8:30 AM	<b>Breakfast</b>	ESJ Ground Floor
8:15 - 8:30 AM	<b>Welcome</b>	ESJ 0224
8:30 - 9:00 AM	<b>KEYNOTE I</b> <b>Darryll Pines</b> , <i>President, University of Maryland, College Park</i>	ESJ 0224
9:00 - 9:15 AM	<b>Break</b>	ESJ
9:15 - 9:45 AM	<b>WIP I</b> <b>Research Opportunities For Educators Who Don't Do Research</b> <i>Todd R. Hamrick, Robin A.M. Hensel, Atheer Almasri, Carter Hulcher, Lizzie Santiago, Susie Huggins, Akua B. Oppong-Anane</i>  <b>Both Sides Now: Examining the Faculty Side of a Student Code Critiquer from a Human Factors Perspective</b> <i>Laura Albrant, Leo C. Ureel II, Lynn A. Albers</i>  <b>First-year Student Support System: A Multi-agentic AI Approach</b> <i>Rui Li</i>  <b>Enhancing Teaching and Learning in a First-Year Course Through the Dual Lens of Student Reflection and Feedback</b> <i>Roshina Babu</i>  <b>Enhancing Student Collaboration Through Growth-Based Assessment Practices</b> <i>Evelyn Walters, Laura Riggio, Cory Budischak</i>  <b>Measuring Student Engagement in Simulated Excel Instruction - Methodological Limitations and Future Directions</b> <i>Atheer Almasri, Todd R Hamrick, Robin A.M. Hensel, Akua B. Oppong-Anane, Lizzie Santiago, Carter Hulcher</i>	ESJ 1224
	<b>WIP II</b> <b>Engineering Culture: Ideologies, Mindsets, and Infrastructure</b> <i>Timothy Duane Reedy, David Tomblin</i>  <b>Bridging Academics and Community: The Impact of Living-Learning Programs on Inclusion, Community, Leadership, and Academic Success</b> <i>Lesly Samantha Murillo, Tabatha Cuadra Rodriguez, Paige E Smith</i>	ESJ 1202

# SCHEDULE

## MONDAY, JULY 28TH 2025

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## DIAMOND



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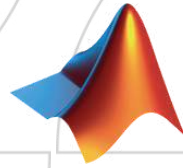
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INSIGHTS



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# SCHEDULE

## MONDAY, JULY 28TH 2025

TIME	EVENT	ROOM
9:15 - 9:45 AM	<b>WIP II (cont.)</b> <b>Fostering Engineering Communities through Collaborative, Student-Led Learning in a First-Year Intro to Engineering Course</b> <i>Ronnie L. Brown</i>  <b>Exploring An Effective Mentorship Structure for Student Success in Higher Education</b> <i>Olukemi Akintewe</i>  <b>Building Supportive Campus Communities Through the MakerSpace Initiative</b> <i>David Kriesberg, Evan Hutzell, Richard Blanton</i>	ESJ 1202
9:45 - 10:30 AM	<b>WIP I &amp; II POSTER SESSION</b>	ESJ Atrium Lounge
10:30 - 10:45 AM	<b>Break</b>	ESJ Ground Floor
10:45 - 12:15 PM	<b>WORKSHOP III</b> <b>Power of Situational Judgment Tests (SJTs): Developing Stronger and More Effective Engineering Graduates (Sponsored)</b> <i>Andrea Wright, Katie Atkins (Acuity Insights)</i> <hr/> <b>CAD for Collaborative, Inclusive, Project-Based Learning with Onshape (Sponsored)</b> <i>Matt Shields, McKenzie Brunelle (Onshape)</i> <hr/> <b>From Ideas to Action: Integrating Entrepreneurial Mindset in FYE Programs</b> <i>Kaitlin Mallouk, J. Blake Hylton, Jack Bringardner, Krista M. Kecskemety, Cassie Wallwey, Andrew Charles Bartolini</i> <hr/> <b>Activity Centric Learning and Teaching with MATLAB - Module 1</b> <i>Lynn A. Albers</i>	ESJ 2204  ESJ 2208  ESJ 1202  ESJ 1224
12:15 - 1:45 PM	<b>Lunch, Group Photo, &amp; Focus on Exhibits</b>	ESJ Ground Floor
1:45 - 3:15 PM	<b>WORKSHOP IV</b> <b>Play as Prep Workshop: Time &amp; Resource-Efficient Strategies for Developing Effective Undergraduate TAs of First Year Students</b> <i>Christine Alexander</i>	ESJ 1202

TIME	EVENT	ROOM
1:45 - 3:15 PM	<b>WORKSHOP IV (cont.)</b> <b>Enhancing Transportation Design Instruction with Bentley OpenRoads (Sponsored)</b> <i>Zack Fredin, Julie Van Portfliet (Bentley Systems)</i>	ESJ 1224
	<hr/> <b>A Deep Dive into Leveraging AI in the classroom with Autodesk Generative Design in Fusion (Sponsored)</b> <i>Dan Banach (Principal Customer Success Manager)</i>	ESJ 2204
3:15 - 3:30 PM	<b>Break</b>	ESJ Ground Floor
3:30 - 4:30 PM	<b>FULL PAPERS I &amp; II</b> <u>Full Paper I:</u> <b>Cultivating Inclusive Excellence: Peer Mentoring Programs for Minoritized Students in Engineering (Research)</b> <i>DeAnna Katey, Terrance I Harris</i>  <b>Exploratory Look at First-Year Engineering Students Sense of Belonging and Belonging Uncertainty</b> <i>Anne Marguerite McAlister, Benjamin Goldschneider, Lisa Lampe, David R. Gutierrez, Esther Tian, Shaylin Williams</i>  <b>Exploring the Relationship between Moral Intuitions and Ethics Education among First-Year Engineering Students in the US, Netherlands, and China</b> <i>Aleia Frye, Scott Streiner</i>  <b>Improving Educational Equity and Outcomes in a First-Year Engineering Programming Course through a Content-and-Language Integrated Approach</b> <i>Saloom Motavas, Fatimah Mahmood</i>	ESJ 1202
	<hr/> <u>Full Paper II:</u> <b>Paying it Forward: How Current Students Advised Future Students in an Engineering Design Course</b> <i>Natalie C.T. Van Tyne, Benjamin Daniel Chambers, Michelle Soledad</i>  <b>Characterizing Conflicts in Student Design Teams in an Introductory Engineering Course</b> <i>Haritha Malladi, Marcia Gail Headley, Pamela S. Lottero-Perdue</i>	ESJ 1224

# SCHEDULE

## MONDAY, JULY 28TH 2025

TIME	EVENT	ROOM
3:30 - 4:30 PM	<b>FULL PAPERS I &amp; II</b> ( <i>cont.</i> ) <i>Full Paper II: (cont.)</i> <b>Leveraging real-time testing data to assess and predict student success in a team-based first-year engineering design project</b> <i>Matthew Patrick Paul</i>	ESJ 1224
4:30 - 5:30 PM	<b>PANEL I</b> <b>A Pathway to a Successful Sabbatical as a First-Year Educator</b> <hr/> <b>PANEL II</b> <b>Student Panel: Building Community and a Strong Professional Presence as an Undergraduate Teaching Assistant</b>	ESJ 2204 <hr/> ESJ 2208
5:30 - 6:00 PM	Depart ESJ	
6:00 - 9:00 PM	<b>KEYNOTE II</b> <b>Amir Ansari</b> , <i>Co-founder &amp; Executive Director, xFoundry@UMD</i>  <b>Keynote Reception &amp; Dinner</b>	The Hall

# SCAN FOR ABSTRACTS



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SCHEDULE  
MONDAY, JULY 28TH 2025



TIME	EVENT	ROOM
7:30 - 8:30 AM	<b>Breakfast</b>	ESJ Ground Floor
8:30 - 10:30 AM	<b>GIFTS I &amp; II</b> <u><b>GIFTS I:</b></u> <b>Boosting Students Who Demonstrate Non-Thriving Characteristics Early In Semester</b> <i>Andrew Charles Bartolini, Joseph A Lyon</i>  <b>Experiential, Research-Based Learning as part of the First-Year Innovative Research Experience's Bio Inspired Robotics Stream.</b> <i>Lena Johnson</i>  <b>Building Empathy and Conflict Resolution Skills: A Role-Playing Activity for First-Year Engineering Faculty and Teams</b> <i>Catherine Marie Hamel</i>  <b>S.W.O.T. Analysis: Who AM I?</b> <i>Lynn A. Albers</i>  <b>Formative Lecture Quizzes to Help Students Improve Their Understanding</b> <i>Kathleen A. Harper</i>  <b>A School Store to Promote Sustainability and Product Iteration in a First-Year Engineering Design Course</b> <i>Michael Galczynski, Matthew Patrick Paul, Amy J. Karlsson</i>  <b>Time Management as a Tool in a Stress Toolkit for First-Year Engineering Students</b> <i>Laura Ann Gelles, Laura Knight, Darren K Maczka</i>  <b>A CHEESE-Y Approach to Safety</b> <i>Dagan Trnka, Ali N Stocks</i>  <b>A Chemical Engineering Module About Coffee</b> <i>Kurt Rhoads, Kathleen A Harper, Heidi B. Martin, Michael William Butler</i>  <b>Role-playing in Service of Developing Psychological Safety in Teams</b> <i>Mirna Mattjik, Michelle Marincel Payne</i>  <b>Building Community and Campus Awareness with Photo Scavenger Hunts for First-Year Engineers</b> <i>Rebecca Kiriazes</i>	ESJ 1202

# SCHEDULE

## TUESDAY, JULY 29TH 2025

TIME	EVENT	ROOM
8:30 - 10:30 AM	<b>GIFTS I &amp; II (cont.)</b> <b><i>GIFTS I:</i> (cont.)</b> <b>Quick Assessment of Course Topics' Impact in First-Year Engineering Seminars</b> <i>Lee Kemp Ryneason</i>  <b>Balance Builders: Stirring Together Community, Conversations, and Culinary Metaphors for Wellness in First-Year Engineering Students</b> <i>Madison Seckman, Alison West</i>	ESJ 1202
	<hr/> <b><i>GIFTS II:</i></b> <b>Data Driven Design: A Two Course Sequence for First Year Engineers</b> <i>Philip Reid Brown, Ashley Joyce Mont, Katie Barillas</i>  <b>Automated Quiz Generation Using Generative AI and QTI for Teaching Content Management Systems</b> <i>Osman Sayginer, Cory Budischak</i>  <b>Bridging Engineering Education with a Cost-Effective Classroom Kit: A Hands-On Approach to Active Learning</b> <i>Osman Sayginer, Cory Budischak, Laura Riggio</i>  <b>Using Robotic Arm Project to Introduce Students to Engineering Design Through Experiential Learning</b> <i>Patrick Thornton, Jaskirat Sodhi, Ashish D. Borgaonkar</i>  <b>Math Quest: Arithmetic Education for Underfunded Schools</b> <i>Ryan McAfee Grudell, Mark Mintzlaff, Ethan Berei, Grace Lawson</i>  <b>Designing for Daily Life: Open-Ended 3D Modeling in First Year Engineering</b> <i>Ashley Joyce Mont, Philip Reid Brown, Katie Barillas</i>  <b>Building a comprehensive First-Year Computing Trajectory</b> <i>Joseph A Lyon, Andrew Charles Bartolini</i>  <b>Using Hardware in an Engineering Mechanics Course</b> <i>Aris Cleanthous</i>  <b>Bridging Code and Circuit: MATLAB-Guided Arduino Walkthroughs for First-Year Engineering Students</b> <i>Dante Charles Scalf, Turner Marks, Kathryn Schulte Grahame, Leila Keyvani</i>	ESJ 1224

SCHEDULE  
TUESDAY, JULY 29TH 2025

[illegible]

TIME	EVENT	ROOM
11:45 - 12:00 PM	Break	ESJ
12:00 - 12:30 PM	Rapporteurs, Awards, & Closing	ESJ 0224
12:30 - 1:30 PM	Boxed Lunches	ESJ
1:00 - 2:30 PM	<b>First-Year Admins Lunch</b>  <b>Optional Tours</b> UMD Traditions Engineering Labs: Neutral Buoyancy Tank (NBT), Wind Tunnel	The Loft (ESJ 2101)  Meet at ESJ Ground Floor

# SCAN FOR ABSTRACTS



GO.UMD.EDU/FYEE2025

SCHEDULE  
TUESDAY, JULY 29TH 2025



# SAVE THE DATE

FYEE 2026 | AUGUST 2-4 | NEWARK, NJ



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# THINGS TO DO



Rub Testudo's Nose for luck



Visit Memorial Chapel Garden



Food & Drink:

The Board and Brew  
Cornerstone Grill & Loft  
Ledo Pizza  
Looney's Pub

MARATHON DELI  
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Vigilante Coffee

Walk Lake Artemisia



College Park Aviation Museum



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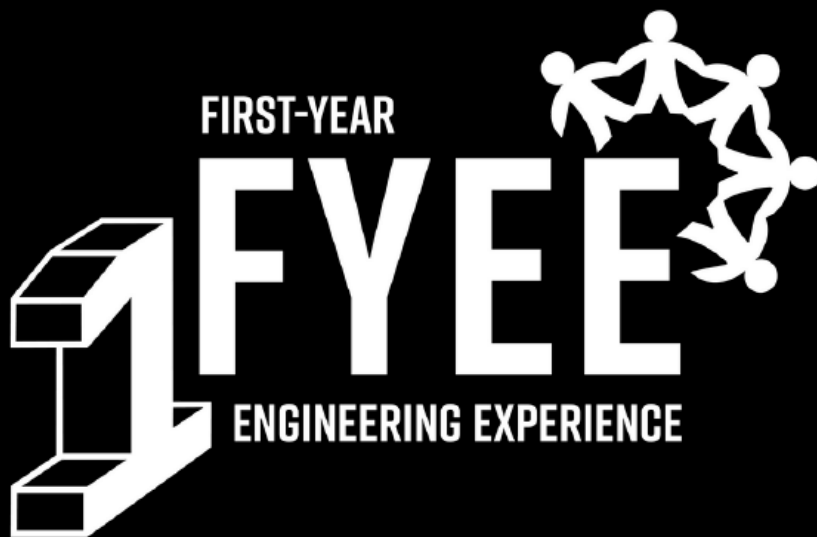
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KEYSTONE PROGRAM

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