

FYEE 2025

ENGINEERING COMMUNITIES: FOSTERING CONNECTIONS FOR FIRST-YEAR SUCCESS





July 27-29, 2025 The University of Maryland, College Park



4-5 WELCOME FROM THE DEAN 6 WELCOME FROM THE GENERAL CHAIRS **CAMPUS MAP** 8-9 **SCHEDULE AT-A-GLANCE** 10 **KEYNOTE I: PRESIDENT DARRYLL J. PINES** 11 **KEYNOTE II: AMIR ANSARI** 13 **SESSION OVERVIEW** 14 SCHEDULE: SUNDAY, JULY 27TH 15-20 SCHEDULE: MONDAY, JULY 28TH 21-24 SCHEDULE: TUESDAY, JULY 29TH 29 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,

Samuethaham

Samuel Graham 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!



- Edward St. John Center (ESJ) Monday & Tuesday Sessions Jeong H. Kim Engineering (KEB) 2 Sunday Registration J.M. Patterson Building (JMP) 3 Sunday Sessions A. James Clark Hall (AJC) 4 Sunday Welcome Reception
- 5 McKeldin Mall

M Circle



6

- The Hall Monday Keynote Reception
- 8
 - The Hotel at the University of Maryland



The Cambria Hotel

College Park Metro Station 104 Shuttle Bus OR 20 minute walk from campus

SCHEDULE

KEY

REGISTRATION	SESSION
BREAK/MEAL	SPEAKER

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

	REGIS	STRAT	ION
7:30			
8:00		MON,	TUE,
9:00		7/28	7/29
10:00		7:30 AM	-
11:00			12:30 PM
		ESJ	ESJ
12:00			
1:00	CUN		
2:00	SUN, 7/27		
2.00	12 PM		
3:00	-		
	6 PM		
4:00	KEB		
5:00			

WHERE DO I REGISTER? SUNDAY: Kim Rotunda MONDAY: ESJ, Ground Floor TUESDAY: ESJ, Ground Floor

AT-A-GLANCE

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

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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-



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

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.

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 WIPS

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

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.

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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The @ world goes to **Maryland.**

TIME	EVENT	ROOM
12:00 - 1:30 PM	Orientation & Onboarding	KEB
1:30 - 2:00 PM	Welcome & Icebreaker	KEB
2:00 - 3:30 PM	WORKSHOP IFirst-Year Engineering Forums: Planning & Organizing Idea- Sharing Sessions with Program Stakeholders to Increase Collaboration and Mutually Beneficial Relationships Cassie Wallwey, Juan David Ortega Álvarez, Benjamin Daniel Chambers, David Gray, Daniel NewcombIntegrating Service Learning into First-Year Engineering Courses: A Hands-On Workshop Kathryn Schulte Grahame, Brian Patrick O'Connell, Anne E SheaDesigning Active Learning Activities with Ethics in Mind, and Body (no matter if this is a fundamental principles class or an ethics-as-a-stand alone class, or any class in-between)	KEB JMP 2116 JMP 2121 JMP 1116
	Nicole Farkas Mogul, David Tomblin, Timothy Duane Reedy	
3:30 - 3:45 PM	Ice Cream Break	JMP
45 - 5:15 PM	WORKSHOP II MATLAB Master Toolkit for Engineering and Educators (Sponsored) <i>Laura Keen (Mathworks), Ken Cleveland (Mathworks)</i>	JMP 2116
	How to Incorporate Autodesk Fusion into your First Year Engineering Program (Sponsored) Dan Banach (Principal Customer Success Manager)	JMP 2121
	Wired for Connection, Not Perfection: Embracing Imperfection in the Engineering Space Audrey Gilfillan, Alison West	 JMP 1116
5:15 - 5:30 PM	Break & Engineering Tours	JMP/AJC
5:15 - 5:30 PM 5:30 - 6:30 PM	Break & Engineering Tours Engineering Tours	JMP/AJC JMP/AJC

SUNDAY, JULY 27TH 2025

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TIME	EVENT	ROOM	1.4.1
		ESJ	
7:30 - 8:30 AM	Breakfast	Ground Floor	
8:15 - 8:30 AM	Welcome	ESJ 0224	
8:30 - 9:00 AM		200 022 1	
	Darryll Pines, President, University of Maryland, College Park	ESJ 0224	
9:00 - 9:15 AM	Break	ESJ	
9:15 - 9:45 AM	WIPI		
	Research Opportunities For Educators Who Don't Do Research	ESJ 1224	
	Todd R. Hamrick, Robin A.M. Hensel, Atheer Almasri, Carter Hulcher, Lizzie		
	Santiago, Susie Huggins, Akua B. Oppong-Anane		
	Both Sides Now: Examining the Faculty Side of a Student Code		
	Critiquer from a Human Factors Perspective		
	Laura Albrant, Leo C. Ureel II, Lynn A. Albers		
	First-year Student Support System: A Multi-agentic AI Approach		
	Rui Li		LO
	Enhancing Teaching and Learning in a First-Year Course Through		02
	the Dual Lens of Student Reflection and Feedback		
	Roshina Babu		\sim
	Enhancing Student Collaboration Through Growth Pased		
	Enhancing Student Collaboration Through Growth-Based Assessment Practices		一王
	Evelyn Walters, Laura Riggio, Cory Budischak		Ō
	Measuring Student Engagement in Simulated Excel Instruction -		N
	Methodological Limitations and Future Directions		
	Atheer Almasri, Todd R Hamrick, Robin A.M. Hensel, Akua B. Oppong-		
	Anane, Lizzie Santiago, Carter Hulcher		
	WIP II		MONDAY, JULY 2
	Engineering Culture: Ideologies, Mindsets, and Infrastructure	ESJ 1202	
	Timothy Duane Reedy, David Tomblin		
	Duideing Academics and Community, The lungest of Living		Z
	Bridging Academics and Community: The Impact of Living- Learning Programs on Inclusion, Community, Leadership, and		
	Academic Success		
	Lesly Samantha Murillo, Tabatha Cuadra Rodriguez, Paige E Smith		

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EXHIBITORS

ACUITY INSIGHTS



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TIME	EVENT	ROOM	1.1.1
9:15 - 9:45 AM	WIP II (cont.) Fostering Engineering Communities through Collaborative, Student-Led Learning in a First-Year Intro to Engineering Course Ronnie L. Brown	ESJ 1202	
	Exploring An Effective Mentorship Structure for Student Success in Higher Education <i>Olukemi Akintewe</i>		
	Building Supportive Campus Communities Through the MakerSpace Initiative David Kriesberg, Evan Hutzell, Richard Blanton		Ξ
9:45 - 10:30 AM	WIP I & II POSTER SESSION	ESJ Atrium Lounge	2
10:30 - 10:45 AM	Break	ESJ Ground Floor	
10:45 - 12:15 PM	WORKSHOP III Power of Situational Judgment Tests (SJTs): Developing Stronger and More Effective Engineering Graduates (Sponsored) Andrea Wright, Katie Atkins (Acuity Insights)	ESJ 2204	2025
	CAD for Collaborative, Inclusive, Project-Based Learning with Onshape (Sponsored) Matt Shields, McKenzie Brunelle (Onshape)	ESJ 2208	8TH
	From Ideas to Action: Integrating Entrepreneurial Mindset in FYE Programs Kaitlin Mallouk, J. Blake Hylton, Jack Bringardner, Krista M. Kecskemety, Cassie Wallwey, Andrew Charles Bartolini	ESJ 1202	JULY 2
	Activity Centric Learning and Teaching with MATLAB - Module 1 Lynn A. Albers	ESJ 1224	
12:15 - 1:45 PM	Lunch, Group Photo, & Focus on Exhibits	ESJ Ground Floor	JAY
1:45 - 3:15 PM	WORKSHOP IV Play as Prep Workshop: Time & Resource-Efficient Strategies for Developing Effective Undergraduate TAs of First Year Students Christine Alexander	ESJ 1202	MONDAY,

TIME	EVENT	ROOM	
1:45 - 3:15 PM	Enhancing Transportation Design Instruction with Bentley OpenRoads (Sponsored) Zack Fredin, Julie Van Portfliet (Bentley Systems) 	ESJ 1224 ESJ 2204	
3:15 - 3:30 PM	Dan Banach (Principal Customer Success Manager) Break	ESJ Ground Floor	H
3:30 - 4:30 PM			
3.30 - 4.30 FM	FULL PAPERS I & II <u>Full Paper I:</u> Cultivating Inclusive Excellence: Peer Mentoring Programs for Minoritized Students in Engineering (Research) DeAnna Katey, Terrance I Harris	ESJ 1202	S
	Exploratory Look at First-Year Engineering Students Sense of Belonging and Belonging Uncertainty <i>Anne Marguerite McAlister, Benjamin Goldschneider, Lisa Lampe, David R.</i> <i>Gutierrez, Esther Tian, Shaylin Williams</i>		2025
	Exploring the Relationship between Moral Intuitions and Ethics Education among First-Year Engineering Students in the US, Netherlands, and China <i>Aleia Frye, Scott Streiner</i>		28TH
	Improving Educational Equity and Outcomes in a First-Year Engineering Programming Course through a Content-and- Language Integrated Approach Saloome Motavas, Fatimah Mahmood		JULY
	<i>Full Paper II:</i> Paying it Forward: How Current Students Advised Future Students in an Engineering Design Course <i>Natalie C.T. Van Tyne, Benjamin Daniel Chambers, Michelle Soledad</i>	ESJ 1224	IAV. J
	Characterizing Conflicts in Student Design Teams in an Introductory Engineering Course Haritha Malladi, Marcia Gail Headley, Pamela S. Lottero-Perdue		MONDAY.

TI		ROOM	1.1.1
3:30 - 4:30	FULL PAPERS I & II (cont.) Full Paper II: (cont.) Leveraging real-time testing data to assess and predict student success in a team-based first-year engineering design project Matthew Patrick Paul	ESJ 1224	
4:30 - 5:30	PM PANEL I A Pathway to a Successful Sabbatical as a First-Year Educator	ESJ 2204	
	PANEL II Student Panel: Building Community and a Strong Professional Presence as an Undergraduate Teaching Assistant	ESJ 2208	H
5:30 - 6:00	PM Depart ESJ		
6:00 - 9:00	 KEYNOTE II Amir Ansari, Co-founder & Executive Director, xFoundry@UMD Keynote Reception & Dinner 	The Hall	25

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TIME	EVENT	ROOM	1.4.4
7:30 - 8:30 AM	Breakfast	ESJ Ground Floor	
7:30 - 8:30 AM			TUESDAY, JULY 29TH 2025 SCHEDUL
	Building Community and Campus Awareness with Photo Scavenger Hunts for First-Year Engineers Rebecca Kiriazes		F

TIME	EVENT	ROOM	1.0.0
8:30 - 10:30 AM	GIFTS I & II (cont.)		
	<u>GIFTS I:</u> (cont.)	ESJ 1202	
	Quick Assessment of Course Topics' Impact in First-Year		
	Engineering Seminars		
	Lee Kemp Rynearson		
	Balance Builders: Stirring Together Community, Conversations, and		
	Culinary Metaphors for Wellness in First-Year Engineering Students		
	Madison Seckman, Alison West		
	<u>GIFTS II:</u>	ESJ 1224	
	Data Driven Design: A Two Course Sequence for First Year Engineers		
	Philip Reid Brown, Ashley Joyce Mont, Katie Barillas		
	Automated Quiz Generation Using Generative AI and QTI for		
	Teaching Content Management Systems		
	Osman Sayginer, Cory Budischak		
	Bridging Engineering Education with a Cost-Effective Classroom Kit:		LO
	A Hands-On Approach to Active Learning		
	Osman Sayginer, Cory Budischak, Laura Riggio		
	Using Dahatia Anna Dusia stata Interaduras Chudanta ta Fusing suing		
	Using Robotic Arm Project to Introduce Students to Engineering Design Through Experiential Learning		
	Patrick Thornton, Jaskirat Sodhi, Ashish D. Borgaonkar		
	Math Quest: Arithmetic Education for Underfunded Schools		D
	Ryan McAfee Grudell, Mark Mintzlaff, Ethan Berei, Grace Lawson		N
	Designing for Daily Life: Open-Ended 3D Modeling in First Year		
	Engineering		
	Ashley Joyce Mont, Philip Reid Brown, Katie Barillas		5
	Duilding a computer size First Vacy Computing Typic story		
	Building a comprehensive First-Year Computing Trajectory Joseph A Lyon, Andrew Charles Bartolini		
	Joseph A Lyon, Andrew Chunes Burtonni		
	Using Hardware in an Engineering Mechanics Course		FUESDAY, JULY
	Aris Cleanthous		
	Bridging Code and Circuit: MATLAB-Guided Arduino Walkthroughs		
	for First-Year Engineering Students		
	Dante Charles Scalf, Turner Marks, Kathryn Schulte Grahame, Leila Keyvani		
	ncyvani -		
			_

ТІМ	EVENT	ROOM	
8:30 - 10:30 A	M GIFTS I & II (cont.) <u>GIFTS II:</u> (cont.) Guiding Students to Technical Report Writing Success with Scaffolded Technical Writing Assignments Nicole Dufalla	ESJ 1224	
10:30 - 10:45 A	M Break	ESJ	
10:45 - 11:45 A		ESJ 1202	SCHED
	Bringing Innovation and Open-Ended Problem Solving to the Classroom Aysa Galbraith, Leslie Bartsch Massey, Heath Aren Schluterman, Latisha Puckett, Gretchen ScrogginNetwork-based Reflection to Support First-year Engineering Students Rachel Smith, Aileen Hentz, Thaddeus Hill		TH 2025
	<i>Full Paper IV:</i> The Impact of the ACCESS Program on Recruiting Cybersecurity Students and Fostering their Academic Success and Career Prospects Katerina Goseva-Popstojanova, Daniel Mackin Freeman, Robin A.M. Hensel	ESJ 1224	111 V 291
	 Exploring the Engineering Major Decision Journey through First-Year Seminars Rumeysa Tekin Baturalp, Nurcan Bac Aligning First-Year Engineering Goals with Major Selection James Nathaniel Newcomer, David Gray, Alice Hyunna Noble, Devin Erb, Annabel Bass What are we Teaching First Year Students? A Qualitative Analysis of Introductory Engineering Course Syllabi 		ILESDAY I
	Anne Marguerite McAlister, Benjamin Goldschneider, Emily Wang, William Harry Keenan		

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	First-Year Admins Lunch	The Loft (ESJ 2101)	
	Optional Tours UMD Traditions Neutral Buoyancy Tank (NBT), Nuclear Reactor, Wind Tunnel	Meet at ESJ Ground Floor	

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SAVERALE DATE FYEE 2026 AUGUST 2-4 I NEWARK, NJ



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KEYSTONE PROGRAM

Designed & Formatted by: Christina Yang, Administrative Coordinator cyang227@umd.edu