

AY 23-24 Fall Kick-Off Celebration

25 August 2023



COLLEGE OF ENGINEERING
AND COMPUTING

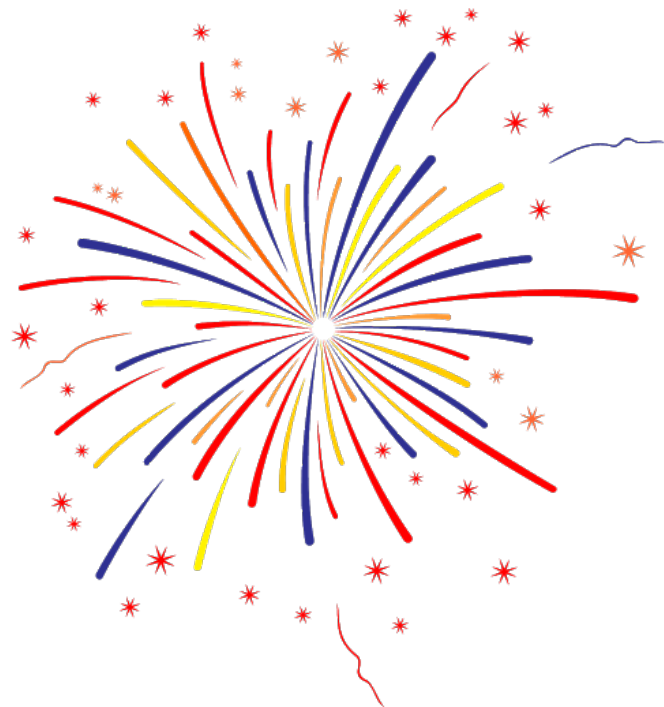


Agenda

- New Faculty and Staff
- Current Demographic Trends
- Challenges faced by Higher Education
- Current Statistics of engineering and computer science degrees
- Evolution of Engineering Education
- Current strategies with a particular emphasis on Miami University
- Fiscal reality



New Leaders in CEC



- Ph.D., Physics, Carnegie Mellon University, Pittsburgh, PA 1997
- M.S., Physics, Carnegie Mellon University, Pittsburgh, PA 1994
- B.S., Physics, Miami University, Oxford, OH 1992
- Joining us from Northern Kentucky University where he served as the Director of the Center for Information Security & Professor of Computer Science

James Walden



Director of Cyber Security Center
Professor
CSE

- Ph.D., Electrical and Computer Engineering, The University of Texas at Austin, 1998
- M.S., Electrical and Computer Engineering, The University of Texas at Austin, 1996
- B.S. Control Engineering, National Chiao Tung University, Taiwan, 1991
- Joined Miami University in 2004 as on of the founding faculty of our ECE department
- Prior to 2004, Dr. Cheng spent 5 years working in the optical communications industry and developed cutting-edge optical communication devices
- His industry work led to three issued U.S. patents and four pending U.S. patents.

New Chair



Dr. Chi-Hao Cheng
Chair Electrical and Computer Engineering

- Ph.D., Mechanical Engineering, Louisiana State University, Baton Rouge, LA, 2003
- B.E., Mechanical Engineering, Birla Institute of Technology (BIT), Mesra, Ranchi, India, 1997
- Joined Miami University in 2006 after serving as a post-doctoral research associate for three years at LSU
- He is an author/co-author of more than 75 peer-reviewed international journal and conference articles
- His research is supported by National Science Foundation (NSF)/TUES, USDA, and AFRL/DAGSI and Mathworks® grants

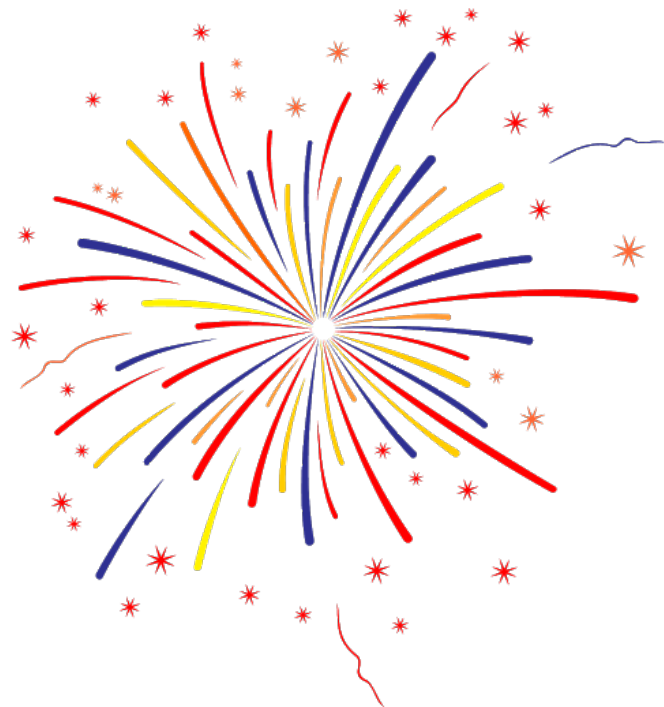
New Chair



Dr. Kumar Singh

Chair Mechanical & Manufacturing Engineering

New CEC Staff



- M.S. Theological Studies, Chaplaincy, Pacific School of Religion, California, 2021
- B.A., English & Spanish, UC Santa Barbara, California, 2005
- Joining us from UCM where she worked as a Multi Channel Content Creator

Katie Rottner



**Director of
Communication &
Marketing
CEC**

New CSE Faculty



**COLLEGE OF ENGINEERING
AND COMPUTING**

*Department of Computer Science
and Software Engineering*



PhD., Computer Engineering, AmirKabir
University of Technology, Tehran, Iran,
2017

M.S., Computer Engineering, Iran
University of Science and Technology,
Tehran, Iran, 2006

B.Sc., Computer Engineering, Iran
University of Science and Technology,
Tehran, Iran, 2003

Behrouz Zolfaghari



**Visiting Assistant
Professor
CSE**

- M.S., Curriculum and Teaching Leadership, Miami University, 2013
- B.S., Supply Chain and Operations Management, Miami University, 2010
- Joining us from a position as a Visiting Assistant Professor of Computer & Information Technology at Miami University

Erikamarie Wick



**Visiting Assistant
Professor
CSE**

- M.S., Electronic and Computer Technology, Indiana State University
- B.S., Computer Science, Indiana State University
- Joining us from the Lewis & Clark Law School where he served as the Director of IT.
- Previous Director of IT for FSB

Jerry Cruez



**Visiting Assistant
Professor
CSE**

- M.S., Computer Science,
University of Cincinnati, 2021
- B.S., Software Engineering, Miami
University, 2019
- Security Research Engineer

Michael Gentile



**Adjunct
Professor
CSE**

- B.S., Systems Analysis, Miami University, 1987
- Joining us with 36 years of Computer Science and Software Engineering across a spectrum of industries.
- Most recently with Eversana as the CIO

Mark MacNaughton



**Adjunct
Professor
CSE**

Promotion to Assistant Lecturer



Rebecca Cruetz
CSE



Kaylynn Borrer
CSE



Meisam Amjad
CSE



Lynn Stahr
CSE



New MME Faculty



**COLLEGE OF ENGINEERING
AND COMPUTING**

*Department of Mechanical and
Manufacturing Engineering*



- Ph.D., Civil and Environmental Engineering, West Virginia University, 2015
- M.S., Mechanical Engineering, University of Nevada, Reno, 2011
- B.S., Mechanical Engineering, Gazi University, Ankara, Turkey, 2008

Murat Dinc



**Associate Teaching Professor
MME**

- B.S., Criminal Law, Kaplan University, 2005
- Majority Owner WARFYTR Equipment
- USMC Vet

Doug Ralph



**Laboratory Technician
& Coordinator
MME**

New ECE Faculty



COLLEGE OF ENGINEERING
AND COMPUTING

*Department of Electrical
and Computer Engineering*



- Ph.D., Electrical Engineering,
University of North Texas, 2022
- M.S., Electrical Engineering,
University of North Texas, 2016
- BTech., Electronics and
Communications Engineering,
Jawaharlal Nehru Technological
University, Kukatpalli, Hyderabad,
2014
- Joining us from industry where she
worked as a Computer Vision
Engineer

Veena Chidurala



**Assistant Professor
ECE**

- Ph.D., Engineering Education, Purdue University, West Lafayette, IN, 2013
- M.S., Earth and Planetary Sciences, University of California at Santa Cruz, 2007
- M.S., Physics, University of California at Santa Cruz, 2006
- B.S., Engineering Physics, Case Western Reserve University, Ohio, 2002

George Ricco



**Associate Teaching Professor
ECE**

- Ph.D., Electrical & Computer Engineering, University of Dayton, OH, 2005
- MBA, Duke University, 2011
- M.S., Electrical & Computer Engineering, Hokkaido Institute of Technology, Japan, 1992
- B.S., Engineering, Northern Jiaotong University, Beijing, China, 1989

Yong Lin



**Assistant Teaching Professor
ECE**

- Ph.D., Electrical Engineering, Air Force Institute of Technology, WPAFB, Ohio, 2014
- M.S., Computer Engineering, Miami University, 2011
- B.S., Computer Engineering, Miami University, 2009
- Currently working as a Senior FPGA Design Engineer at Defense Engineering Corporation

Jason Pennington



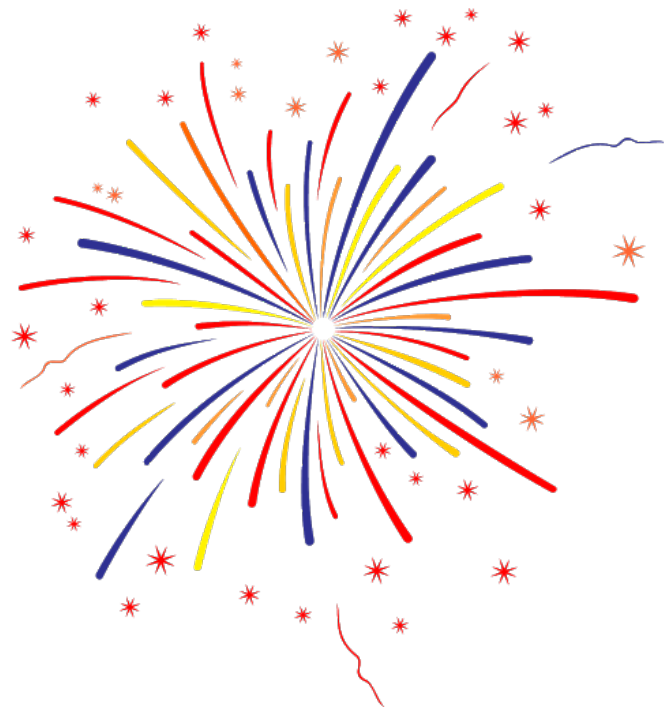
**Visiting Assistant Professor
ECE**

New CPB Faculty



COLLEGE OF ENGINEERING
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*Department of Chemical, Paper,
and Biomedical Engineering*



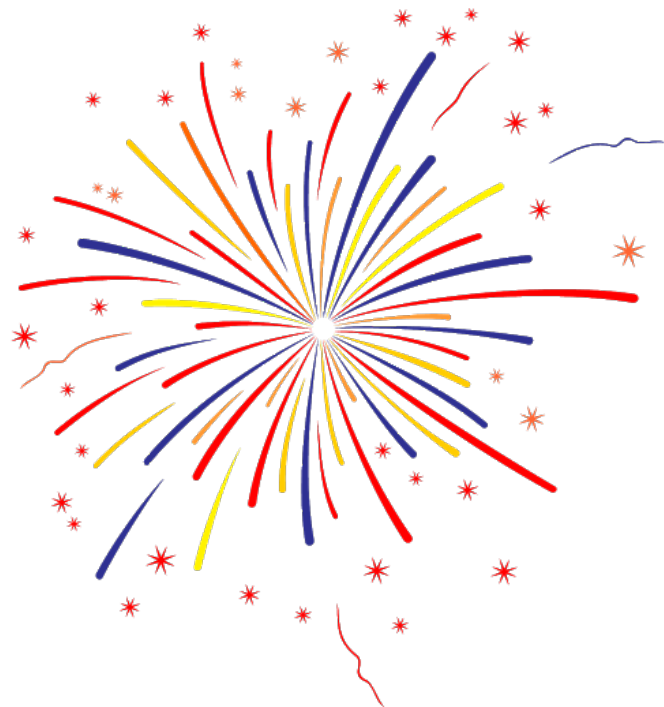
- B.S., Biomedical/Medical Engineering, University of Texas, Austin, 2009
- M.S., Biotechnology Enterprise and Entrepreneurship, Johns Hopkins University, 2020
- Joining us from Stryker where he is the Director of Regulatory Affairs

John Rossman



**Adjunct
Professor
CPB**

Faculty & Staff Recognition



**National Institute
of Health Award
\$2,013,657**

**Justin Saul
Professor
CPB**



**Medal of
Commendation
from the Faculty of
Metals Engineering
and Industrial
Computer Science
at AGH University
in Krakow**

**Carter Hamilton
Associate Professor
MME**



**Senior Member of
the National
Academy of
Inventors**

**Andrew Jones
Associate Professor
CPB**



Swagelok Professor of Mechanical and Manufacturing Engineering

Fazeel Khan
Professor
MME



Greg '91 and Karen Gonzalez Endowed Professorship

DJ Rao
Professor
CSE



**Arthur Olson
Generational
Teaching
Excellence Award**

**Alan Ferrenberg
Assistant Teaching Professor
CSE**



CEC Outstanding Researcher Award

Andrew Jones
Associate Professor
CPB



**2023 Excellence
in Service Award
is awarded to...**

**Doug Hart
Lab Coordinator & Technician
CPB**



**2023 CEC DEI
Award is awarded
to...**

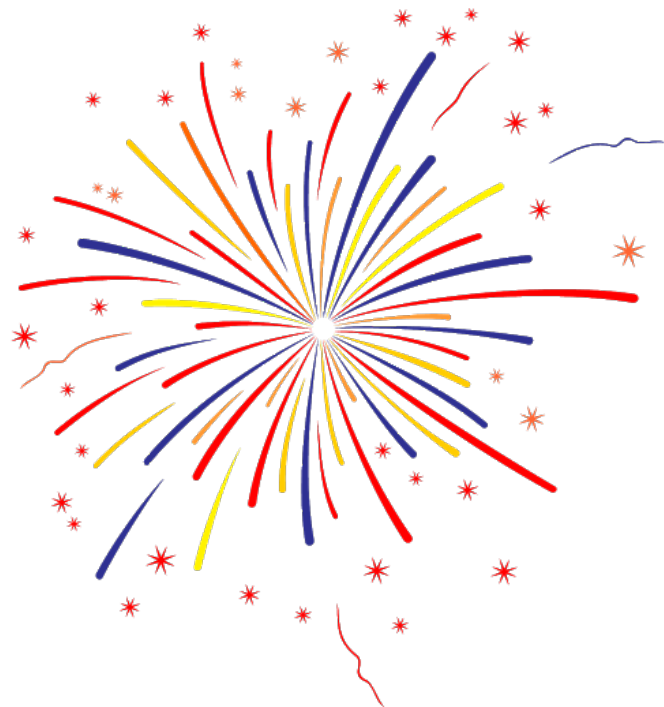
Keisha Norris

Academic Advisor

Assistant Director Diversity
Initiatives
ECE / CEC



Student Recognition



National Level Recognition

**2023 Astronaut
Scholar**

Luke Liang
Computer Science
Data Science
Statistics



National Level Recognition

**Ohio Space Grant
Consortium Scholarship
&**

**Presented at the SMART
2023: 10th ECCOMAS
Thematic Conference
held in Patras, Greece
July 2023**

Miranda Eaton

MS Mechanical Engineering

BS Mechanical Engineering

MME



National Level Recognition

TAPPI National Scholarship Winners



Emily Baker
Process Control
Division



Colin McEwen
DEI Division



Kate Ross
Corrugated Division
John O. Telesca



Mason Schwartz
Randy Kempfbeck &
Jon Hayes Memorial



National Level Recognition

AICHE Undergraduate Poster Winners



Evan Danielson
2nd Place Food,
Pharma, & Biotech
VII



Asia Flores
1st Place Food,
Pharma, & Biotech
VII



Rachel Olp
1st Place Catalysis
and Reaction
Engineering I



Luke Carter
1st Place Food,
Pharma, & Biotech IV



Kerri Peterson
1st Place Education
& General Papers I



Provost's Student Academic Achievement Awards

Three CEC students received the 2023 Provost's Student Academic Achievement Award for their outstanding contributions to Miami University's intellectual environment

CEC students:

- 3 out of 15 MU awards in 2022
- 39 out of 157 since '08



● **Rachel
Olp**

- Chemical Engineering
- Energy



● **Maddie
Weaver**

- Mechanical Engineering
- Premedical Studies
- D1 Athlete Synchronized Skating



● **Taylor
LaValley**

- Biomedical Engineering
- Premedical Studies



Recognition Ceremony Speaker

Max Schneider (CSE)

Returning to Miami University to complete his MS



Recognition Ceremony Nominees



Elise Belanger
MME

Maddy McKinney
CPB

Sonny Grooms
ECE



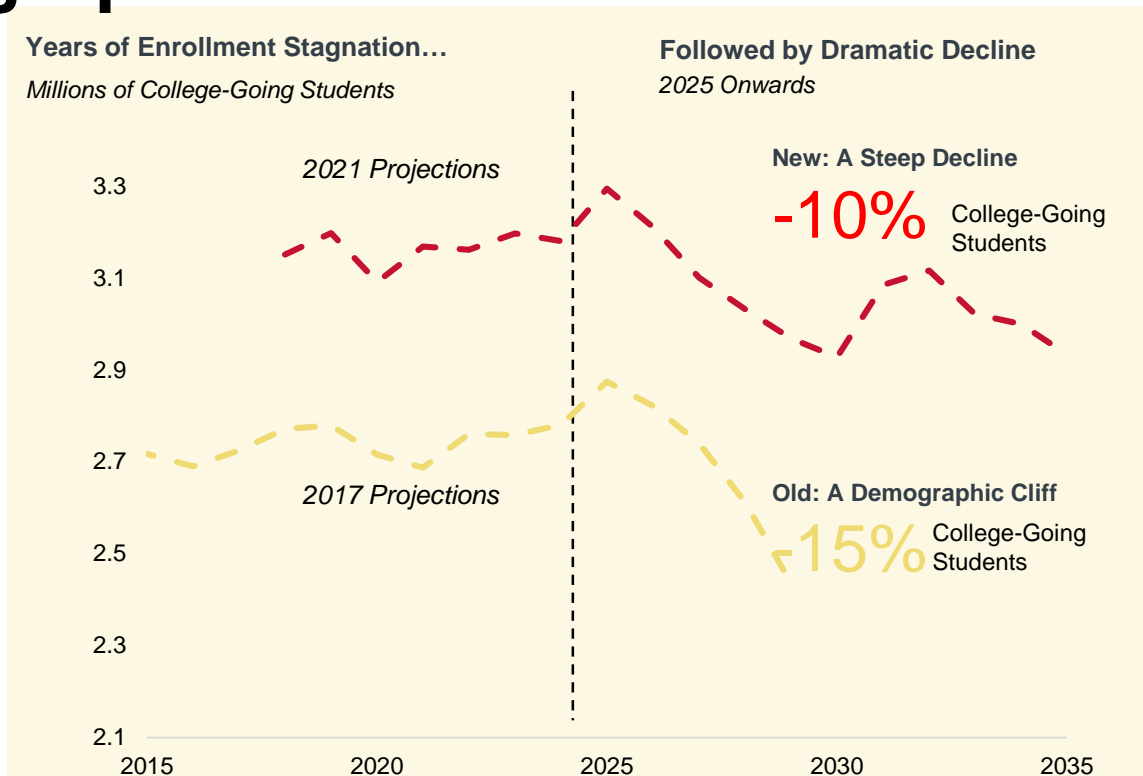


COLLEGE OF ENGINEERING
AND COMPUTING

Challenges we face:

The Future Landscape: Threats to Higher Education

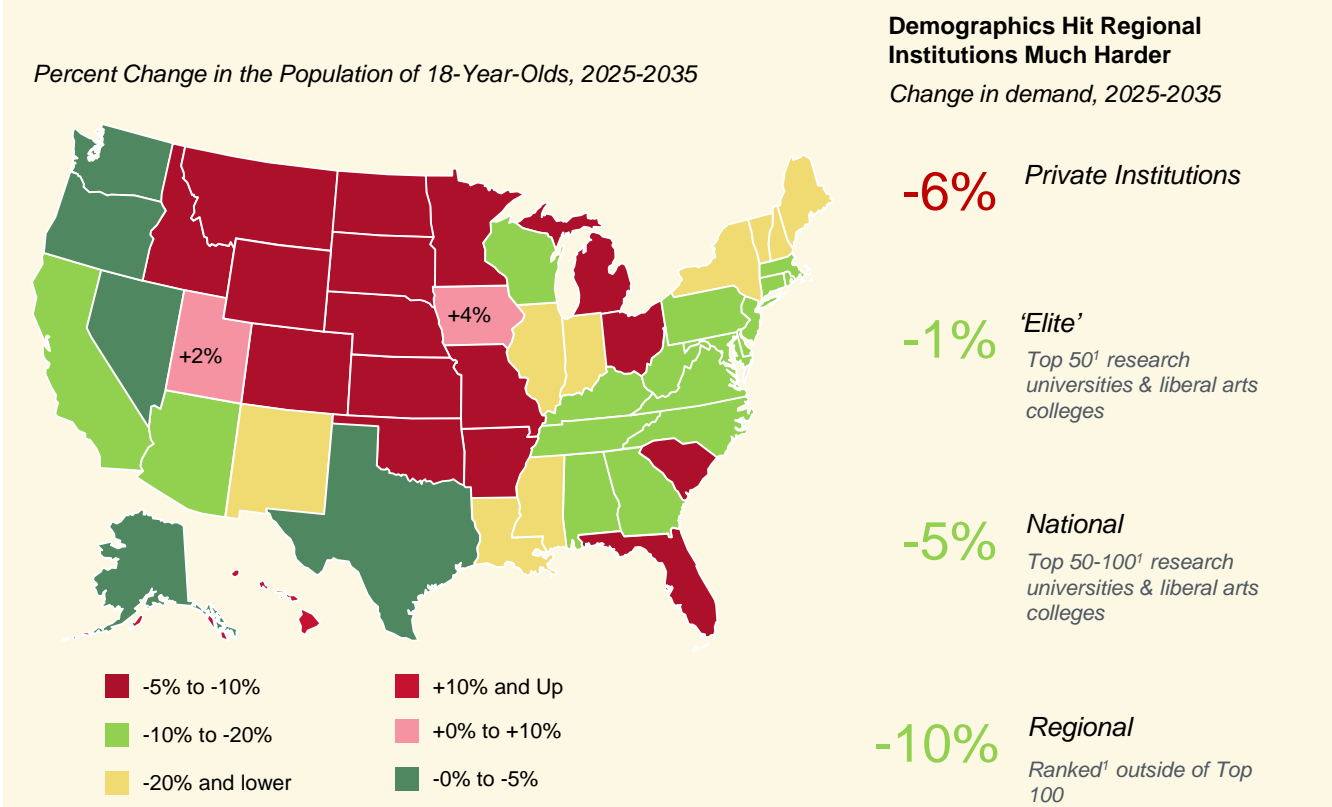
Demographic Cliff



Western Interstate Commission on Higher Education (WICHE), *Knocking at the College Door*, 2016; Grawe, Nathan D., *Demographics and the Demand for Higher Education*, 2017; EAB analysis.



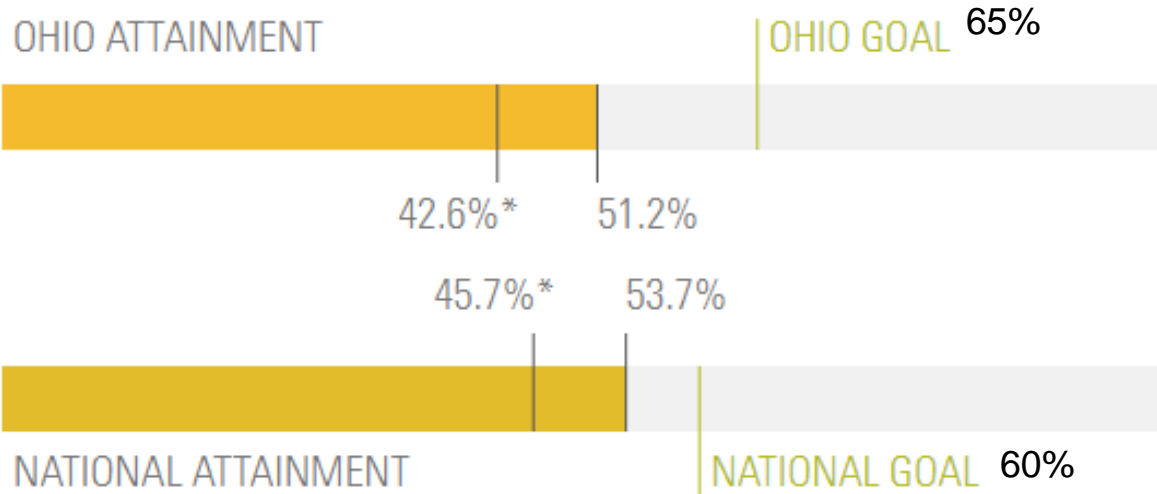
% Change in Population of 18-Year-Olds 2025-2035



America's Progress to the 60% Attainment Goal

Age Range 25-34 25-64

**A STRONGER NATION
LEARNING BEYOND HIGH
SCHOOL BUILDS AMERICAN
TALENT**



*without short-term credentials



Other Threats to Higher Education

Affordability

Forty-one percent of students in 2022 said it was “very difficult” or “difficult” for them to remain in their programs due to economic factors

Value of and access to higher education

Disparate preparation in high school

Mental health challenges

The State of Higher Education Report 2022 – Lumina Foundation



Ohio Higher Education Challenges

Understanding Ohio's areas of greatest risk to educational opportunity is critical to creating effective public policies for the future.



Education Performance

Risk: MODERATE 34th in the nation



Education Equity

Risk: HIGH 40th in the nation



Higher Education Funding & Productivity

Risk: MODERATE 22nd in the nation

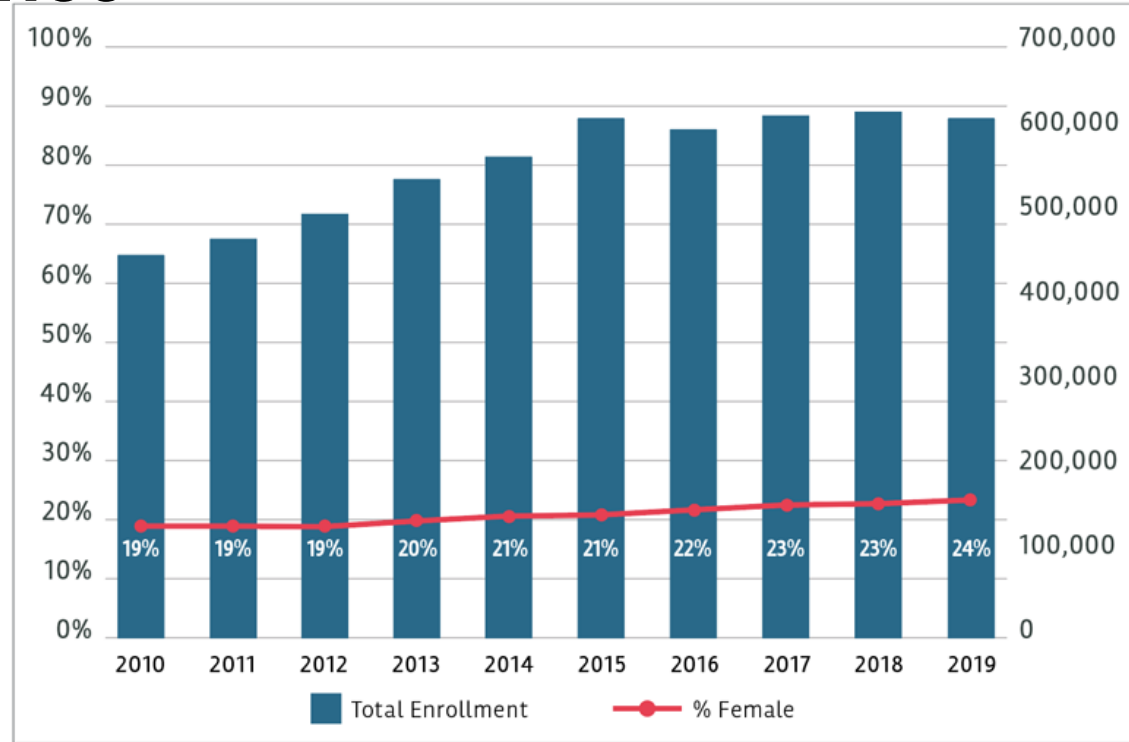
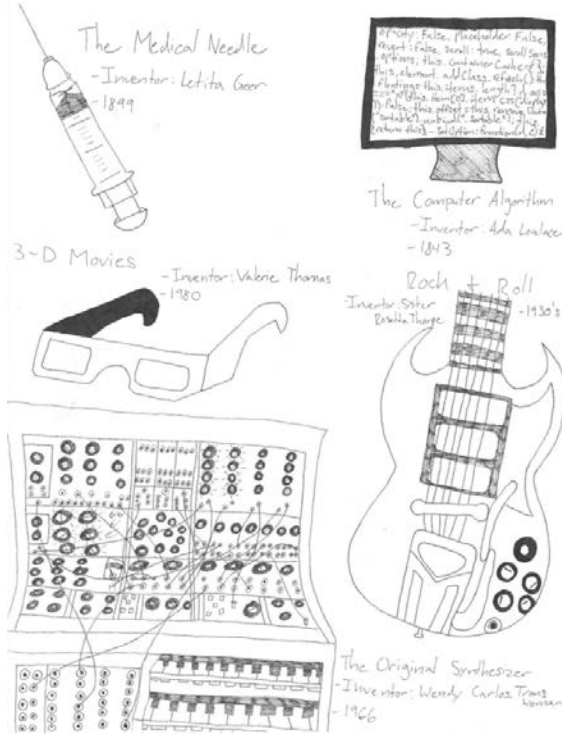


State Economy & Finances

Risk: MODERATE 22nd in the nation



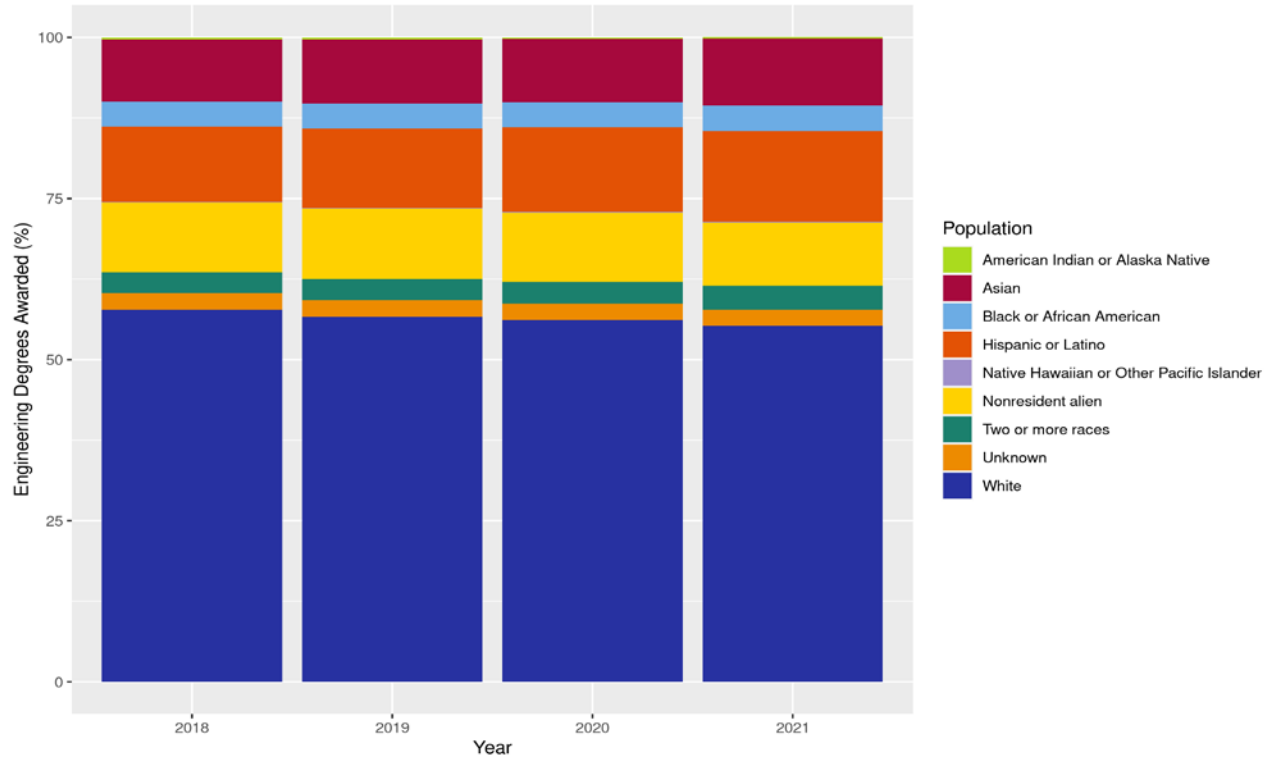
Undergraduate Engineering Enrollment and Gender Imbalance



Source: ASEE Engineering by the Numbers reports, 2011 to 2020.



Engineering Demographics (ASEE)



Statistics & Data Hub, Postsecondary Engineering Degrees Awarded (Version 1.3.5). Computing Research Association, Center for Evaluating the Research Pipeline. Accessed 2023-05-12, <https://bpcnet.org/statistics/>.



Educating Millennials, Generation Z and Generation Alpha

How does Gen Z learn?

Gen Z students generally have a shorter attention span than millennials.

being passive learners.

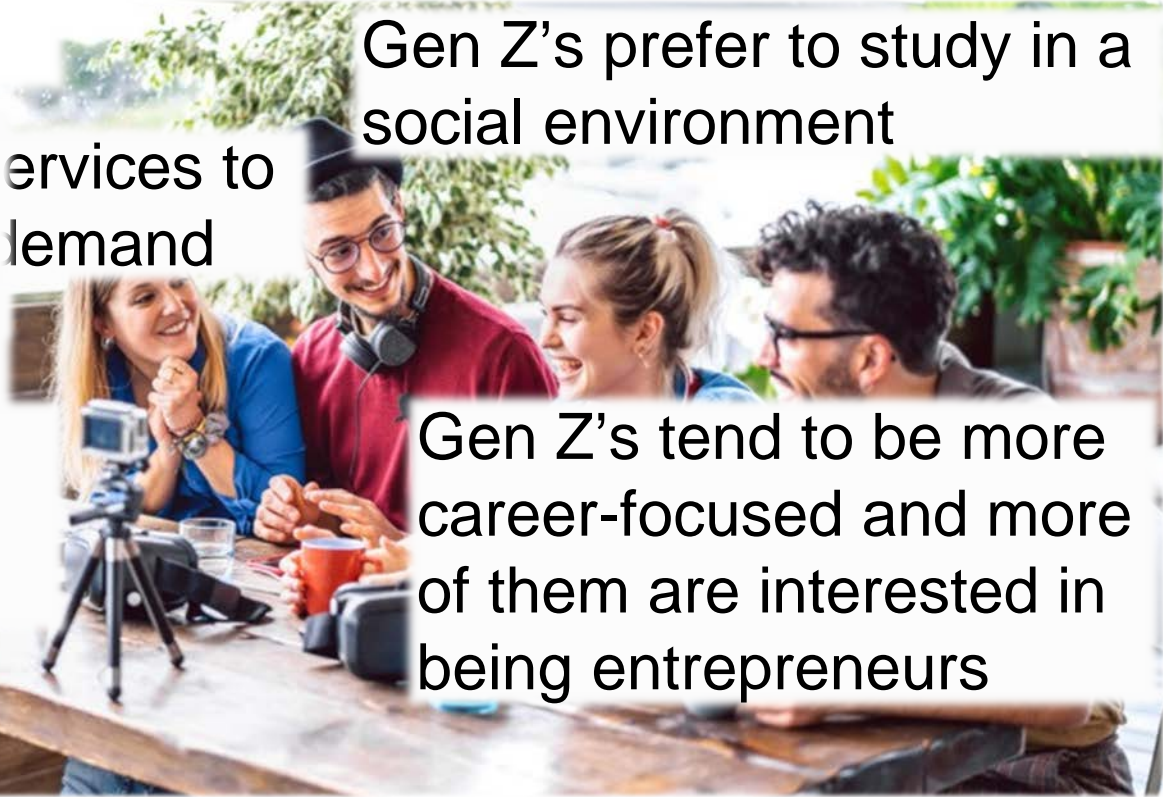
Gen Z's prefer to communicate through images and videos

GENERATION Z

Born Between 1995-2015

Gen Z's prefer to study in a social environment

Gen Z's tend to be more career-focused and more of them are interested in being entrepreneurs





COLLEGE OF ENGINEERING
AND COMPUTING

Opportunities:

Our College



College of Engineering and Computing

VISION:

To be an **inclusive**
community of scholars:

- known for **exceptional**
personalized
engineering and
computing education
- which **champions** technical
innovation, entrepreneurial
mindset, leadership, and
advancing technology for
societal good.



At CEC, we will...

Constantly **INNOVATE**
the delivery of
engineering
and computing
education

HOW

- Increase faculty adoption of high-impact pedagogical approaches.
- Provide clear pathways to help students transition into CEC programs, enhance upward curricular mobility, and facilitate career success.
- Update physical spaces to facilitate collaboration and community.

Embrace **INGENUITY**
to increase
collaboration
and research
participation

HOW

- Enhance graduate program to support faculty research and workforce needs
- Identify areas of technical strength and facilitate resources for research success

Amplify the **IMPACT**
of our people
and programs
by elevating
CEC visibility

HOW

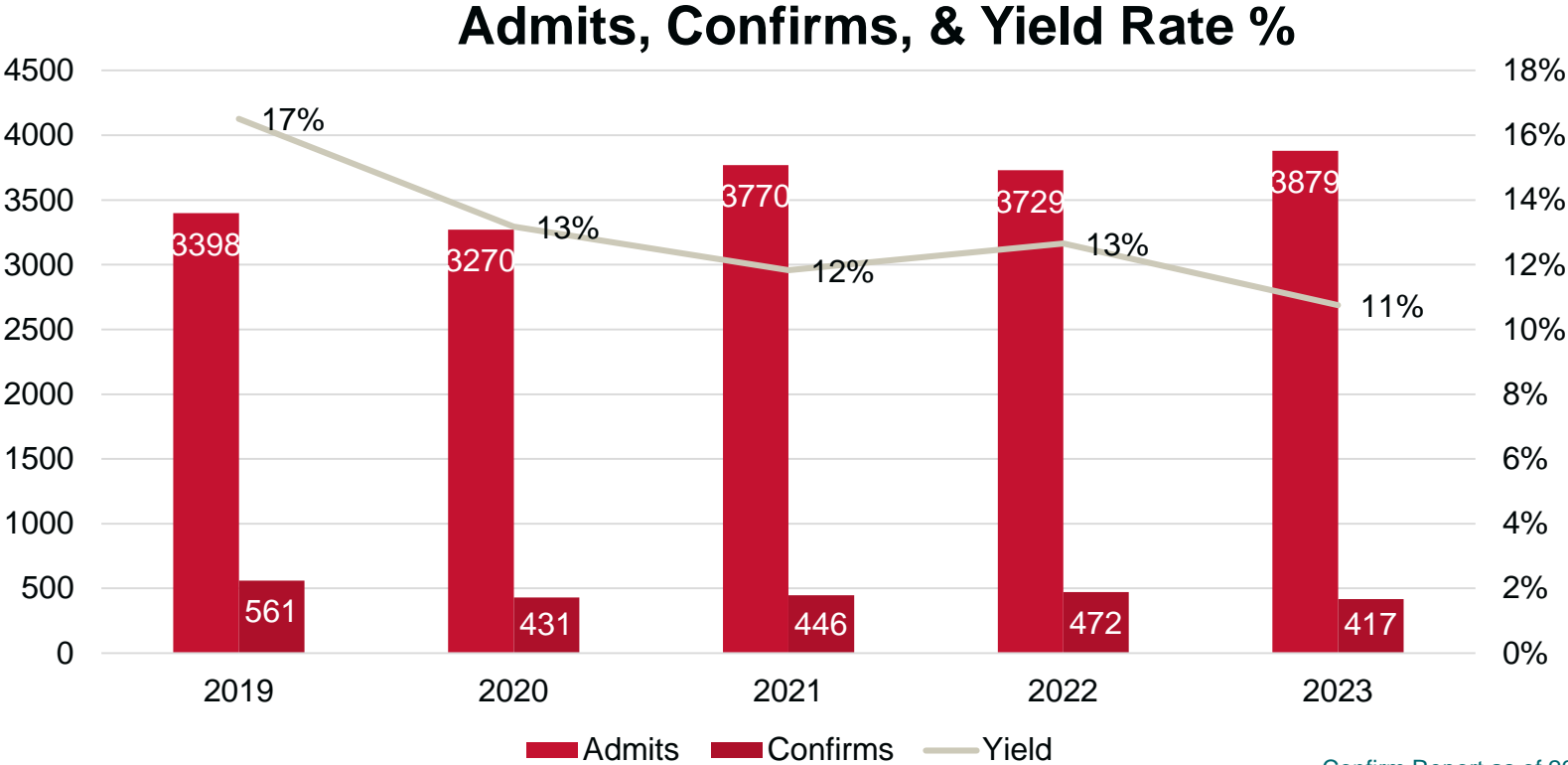
- Showcase CEC scholarship, ingenuity, and achievement at the national level
- Build and sustain industry and community partnerships and enhance outreach opportunities

Build a strong sense
of **INCLUSION AND
BELONGING** where
all are welcome
and valued

HOW

- Increase opportunities for students to explore interests, form communities and build network connections
- Increase opportunities to strengthen faculty and staff interpersonal connections, rewarding contributions to inclusivity

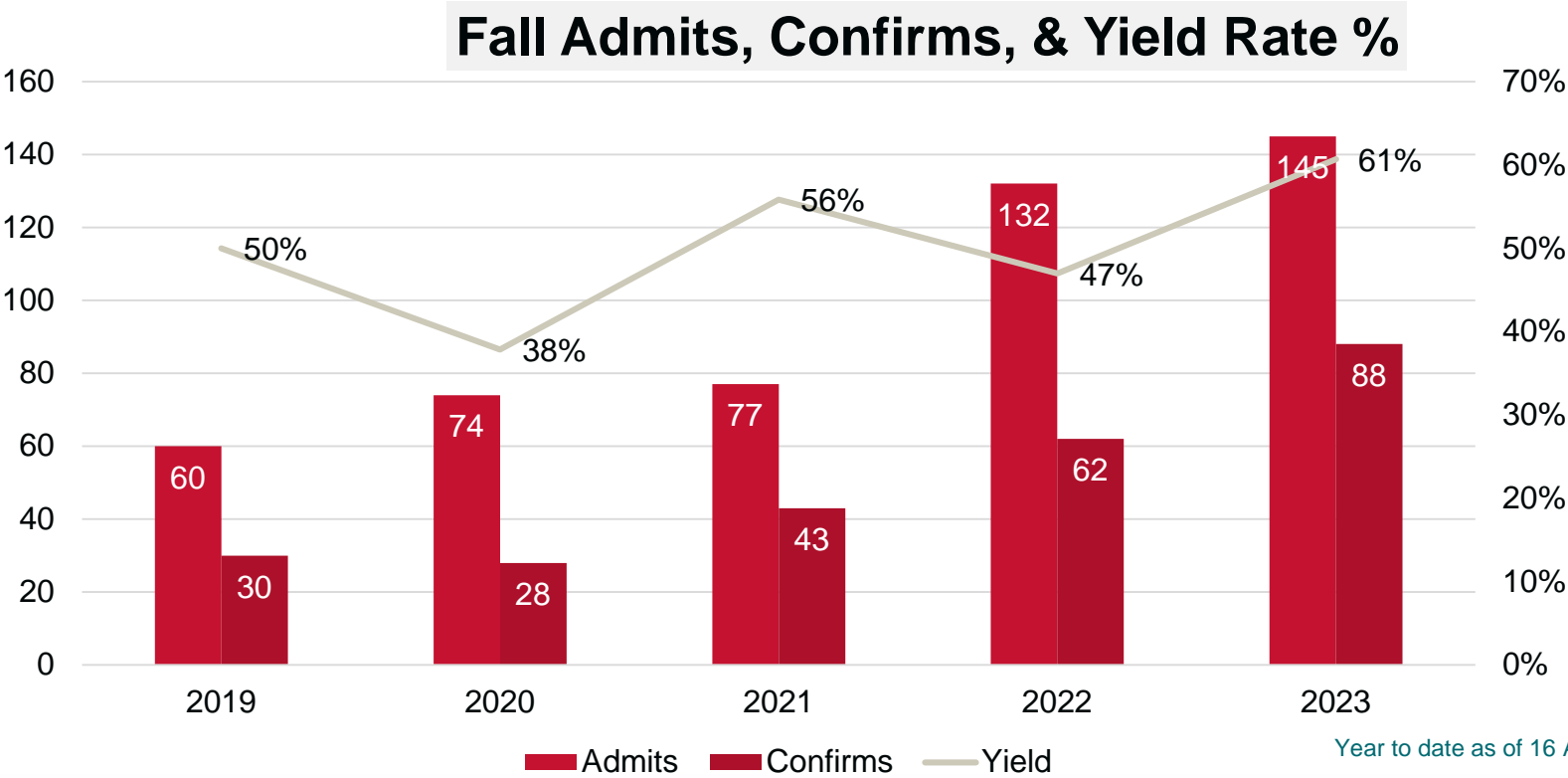
Undergraduate Admissions



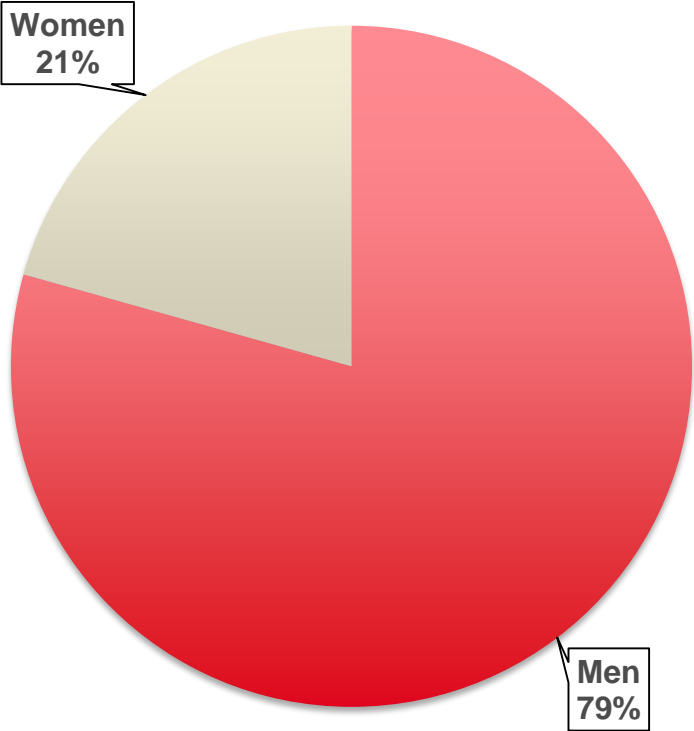
Confirm Report as of 22 Aug 2023



Graduate Admissions



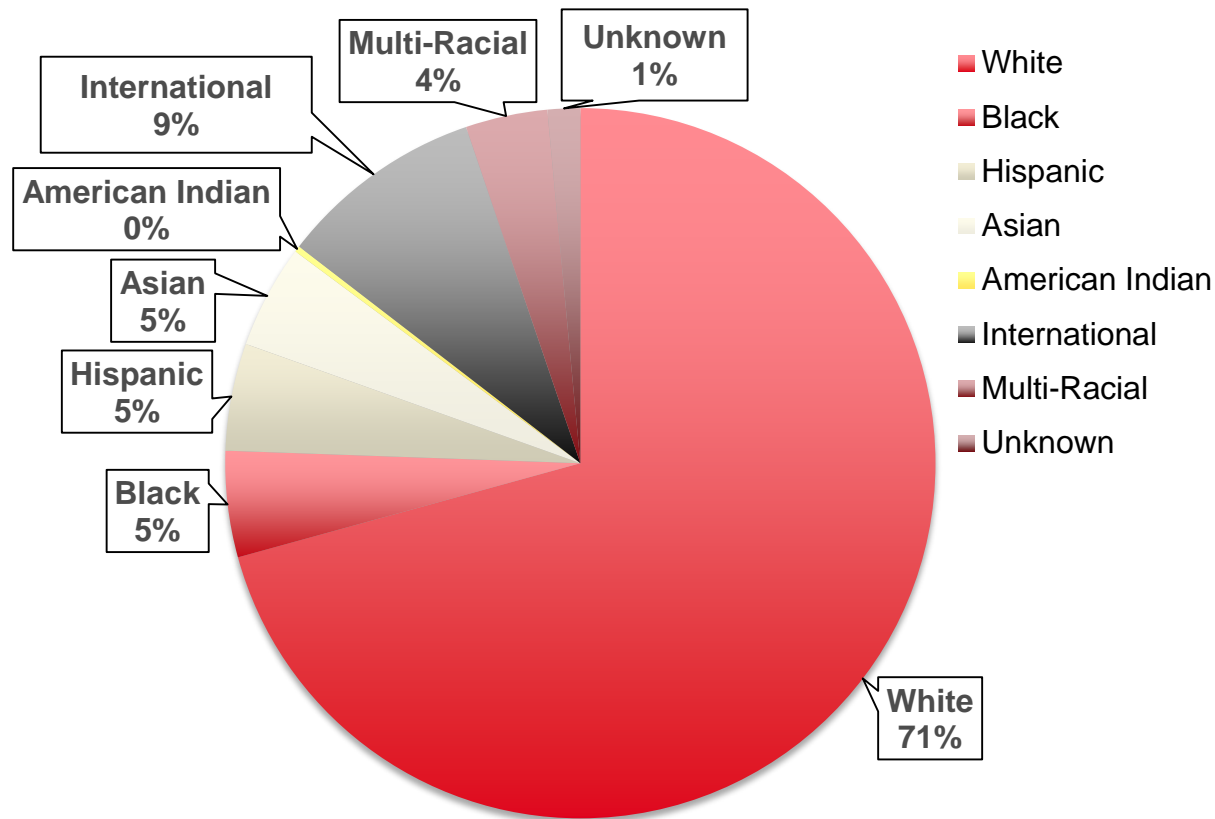
Gender Balance in CEC



Gender	Oxford Students
Male	1445
Female	376



Demographics of CEC students



As of 4 August 2023

Outreach to K-12



725+ Youth

13 Industry & Community Partners

9 School Districts

Received 5 External Grants



Retention Rates by Group

- Miami University's overall rate of retention is high (90%)
- Students who are Pell-Eligible (PE) or First Generation (FG) are less likely to be retained (88% and 85% respectively) than their counterparts who are neither (91%)
- Those who are both Pell-Eligible and First Generation have an even lower likelihood of being retained (81%)

Group	Oxford Campus Retention Rate
Neither PE nor FG	91%
All Students	90%
Pell-Eligible	88%
First-Gen	85%
PE and FG	81%





Responding to Future Workforce Needs



Degrees of the Future

- **Boldly Creative Funded Initiatives**

- B.S. Robotics (ABET visit in Summer 2024)

- Automation and Industrial Manufacturing Graduate Certificates (Tech Cred)

- B.S. Cyber Security

- **New Programs Approved by the State (Rollout Fall 2023)**

- M.S. Clinical Engineering

- BA in Computer Science

- BS in Cybersecurity



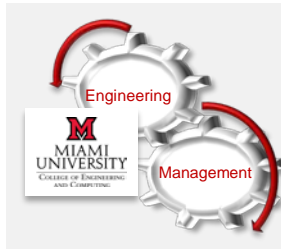
Curriculum Reform



- Integration of the Entrepreneurial Mindset



- Environmental Engineering + Accounting – Minor in Climate Accounting and Engineering



- Added Entrepreneurship Track



- Curriculum Development

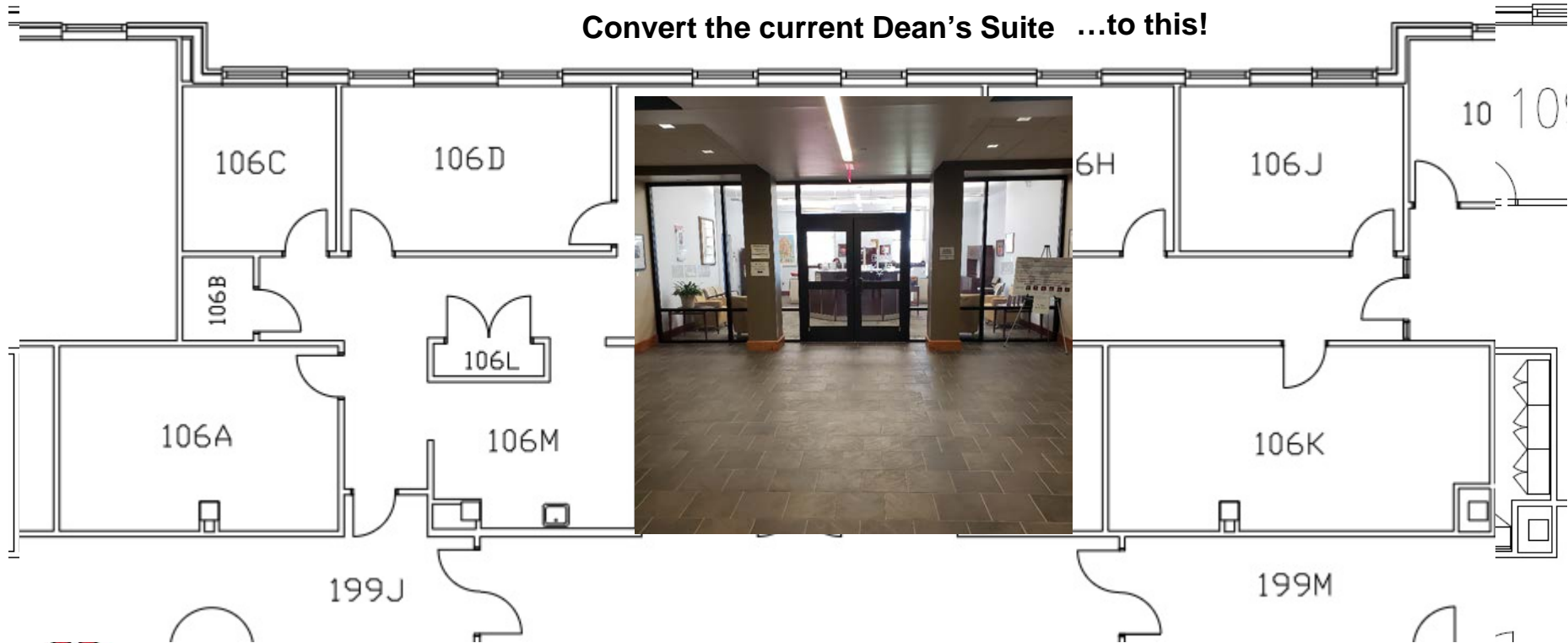


- Curriculum for semiconductor industry

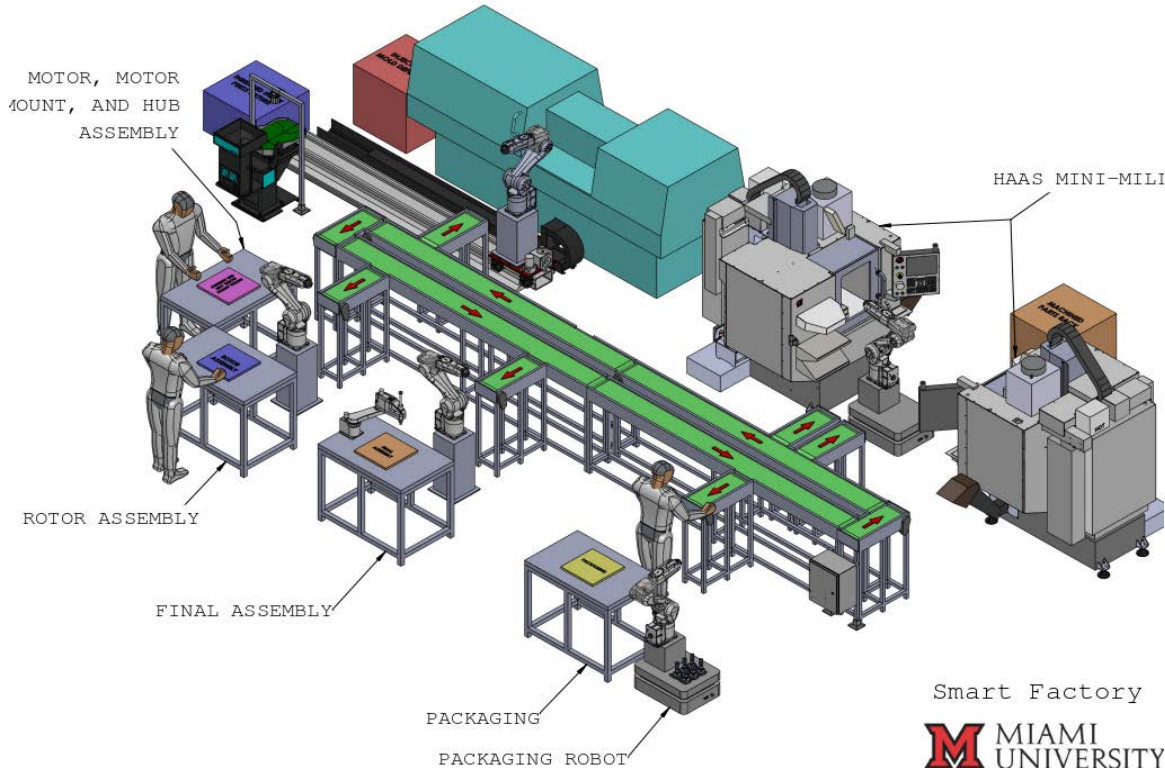


First Year Project Lab

Convert the current Dean's Suite ...to this!



Smart Manufacturing Lab



Components of the smart factory lab

- Milling machines
- Robots – seven axis gantry robot, SCARA robot (Sorting and material handling etc.)
- Injection Molding
- Vision System – Quality Control
- Human Machine Interface (HMI) stations
- Guided Vehicle
- Conveyor system (Chain and magnetic levitation)
- Digital Warehouse with Tending robots
- Data servers

Rick McVey Data Science Building

Open in January 2024

CSE moving to new spaces

- Cybersecurity lab
- Additional Computer lab
- Two dedicated CSE Classrooms

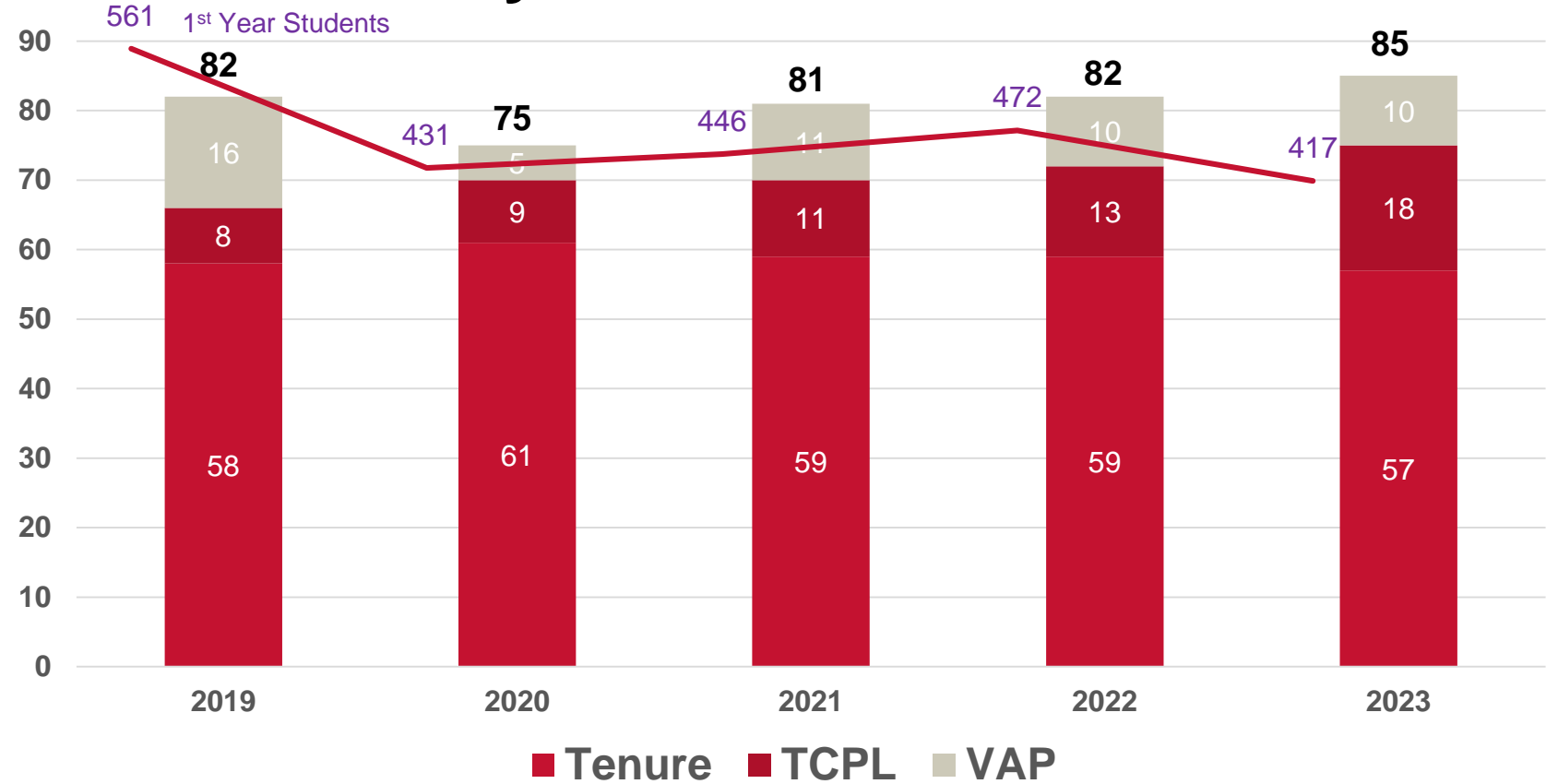


Unique Programs to promote workforce development

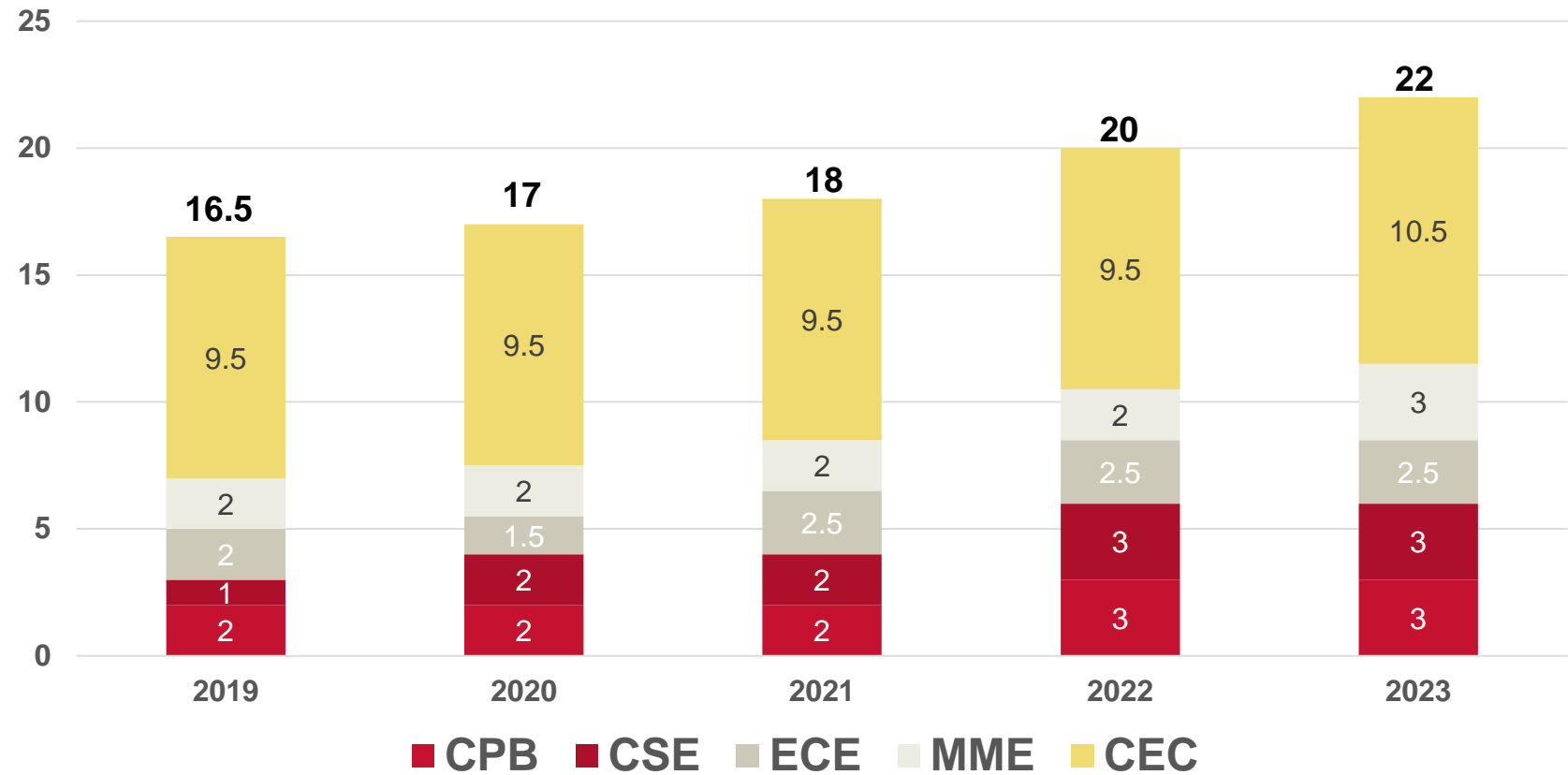
- Automation and Industrial Manufacturing Graduate Certificates (Tech Cred)
- Springboard to Automation and Summer Internship (SASI) & Maintenance and Reliability Internship (MARI)
- Workforce Development for 5G/Wireless Industry
- Courses to support workforce needs in the semiconductor industry
- Co-Op Program in Computer Science



Growth in Faculty

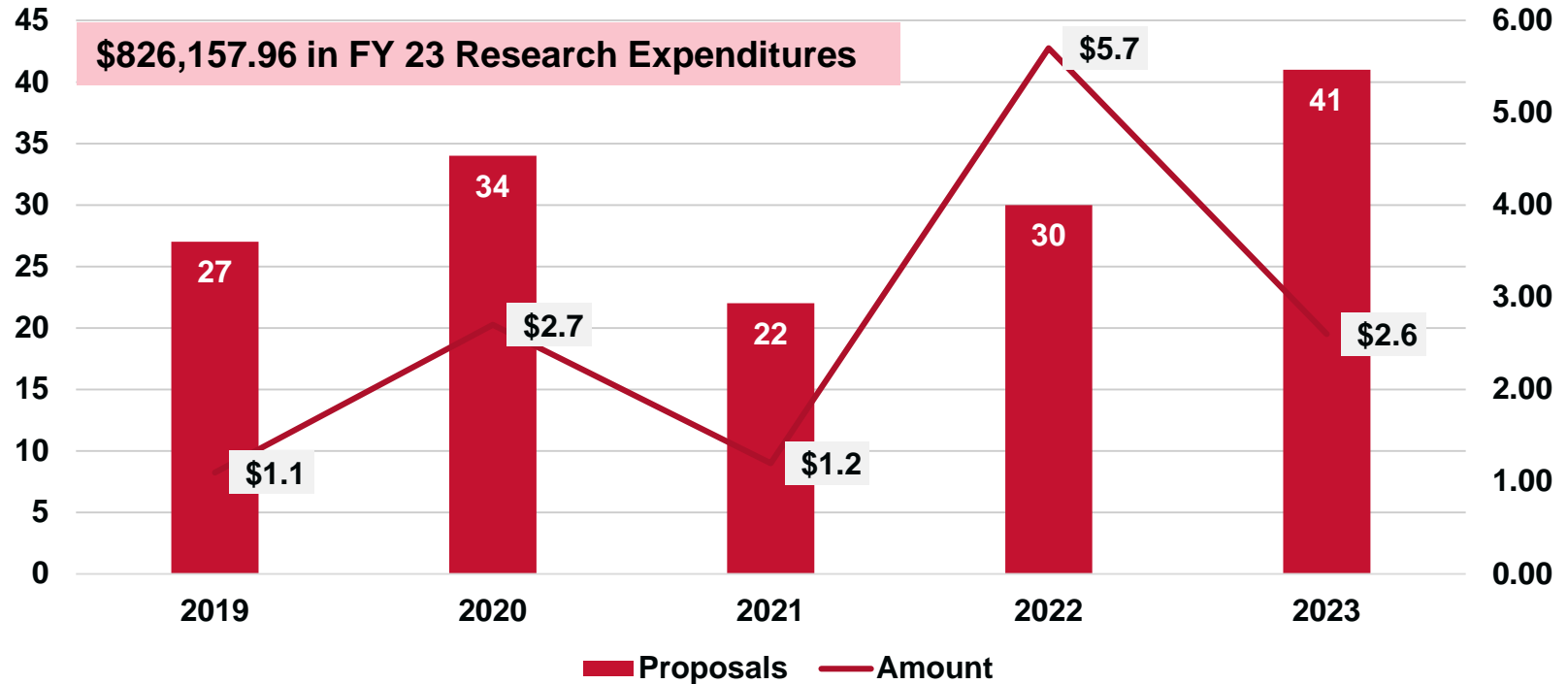


Growth in Staff



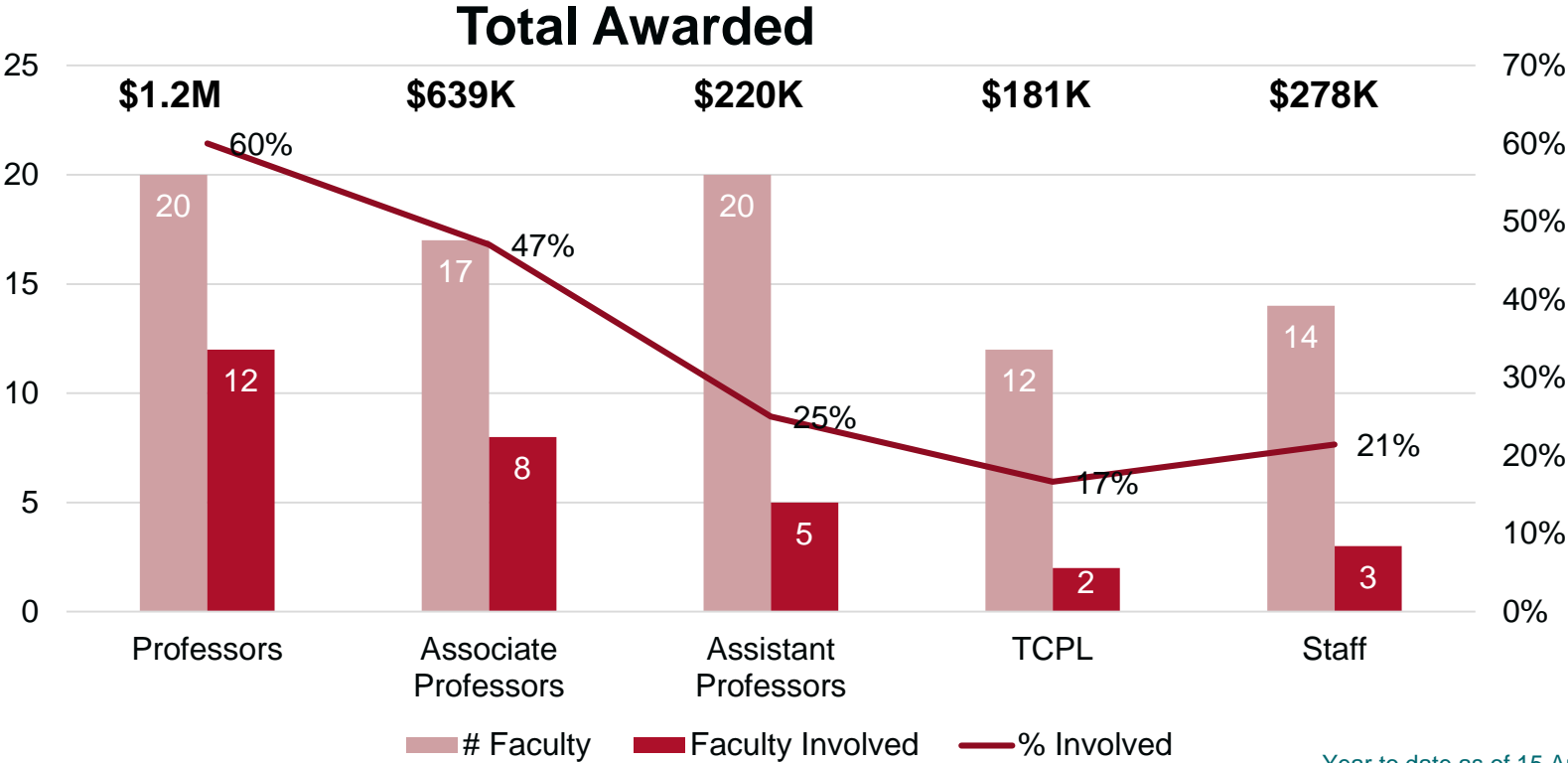
External Awards Received

Number of Awards and Total \$ Amount in Millions



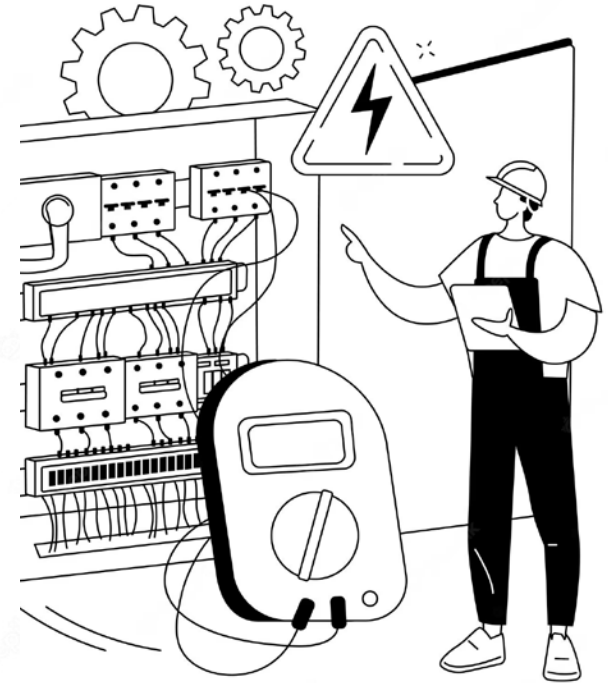
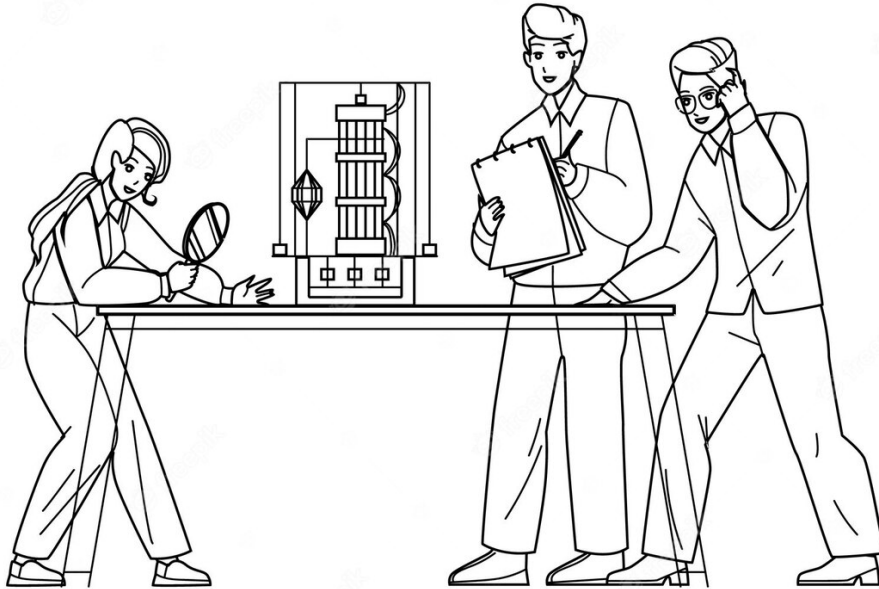
Year to date as of 15 August 2023

CEC Awards by Faculty and Staff



Summer Investment in Infrastructure Enhancement

FY23 year-end infrastructure enhancements in CEC \$334,836



Fundraising

- \$5.3M Raised – Largest Year Ever
- \$4.8M Cash Received – Largest Year Ever
- Over \$3.2M directly to support Faculty, Programs and Equipment & Technology
- First Endowed Presidential Scholars scholarship on campus
- For love. For honor. FOR THOSE WHO WILL.
 - Has surpassed our last campaign by 233% - Currently \$28.3M raised
- **THANK YOU!** Over 50 faculty and staff helped directly engage with Alumni & Donors last year



Alumni Relations

How can MUAA help you?

- Communications & outreach
- Data support
- Alumni event planning
- Content collaboration & faculty engagement (webinars, special MUAA events, ect.)

Year in Review:

- Established CEC Women's Advisory Committee Alumni Speaker Series webinars
- THREE CEC alumni honored with the 18 of the Last 9 Alumni Award!
- Faculty participation at Grandparents College
- Alumni Weekend CEC Alumni reception
- CEC Alumni & Friends Conference (91 attendees)

Coming Soon!

- CEC Faculty Webinars - if you have an idea, topic, or exciting research that would make for good presentation topic suitable for a general viewing audience, please contact Mollie Young
- 2023-2024 18 of the Last 9 Alumni Award [nominations open August 1-31](#)

QUESTIONS? Please reach out to MUAA CEC liaison, Mollie Young at youngmr@miamioh.edu





COLLEGE OF ENGINEERING
AND COMPUTING

Challenges we face:

CEC Fiscal Reality

CEC RCM revenues, in million \$

	Total Undergrad. NIR**	Total Graduate NIR	Total NIR	State Share	Other Revenues ***	Total Revenue Sources
FY'20	21.23	0.24	21.47	6.45	1.03	28.95
FY'21	18.37	0.23	18.60	6.81	1.50	26.91
FY'22	17.52	0.25	17.77	6.88	1.92	26.57
FY'23	16.43	0.29	16.72	7.06	1.61	25.39

* All projections in this presentation as of 6/30/2023

** NIR – net instructional revenues, four-year averages

*** Other revenues: overheads, university investment income, non-divisional students



RCM expenses, in million \$

	CEC Direct Expense Budget	Support Center Allocation and Other University Expenses	Total Expenses
FY'20	12.87	12.72	25.59
FY'21	12.41	11.79	24.20
FY'22	13.38	11.68	25.06
FY'23	14.12	12.81	26.93



RCM revenues, expenses and ending balance in million \$

	Total Revenue Sources	Total Expenses	Ending Balance Before Subvention
FY'20	28.95	25.59	3.36
FY'21	26.91	24.20	2.71
FY'22	26.57	25.06	1.51
FY'23	25.39	26.93	-1.54



Socially Engaged Engineering & Computing (SEEC)

Engineering and Computing with a positive Impact

