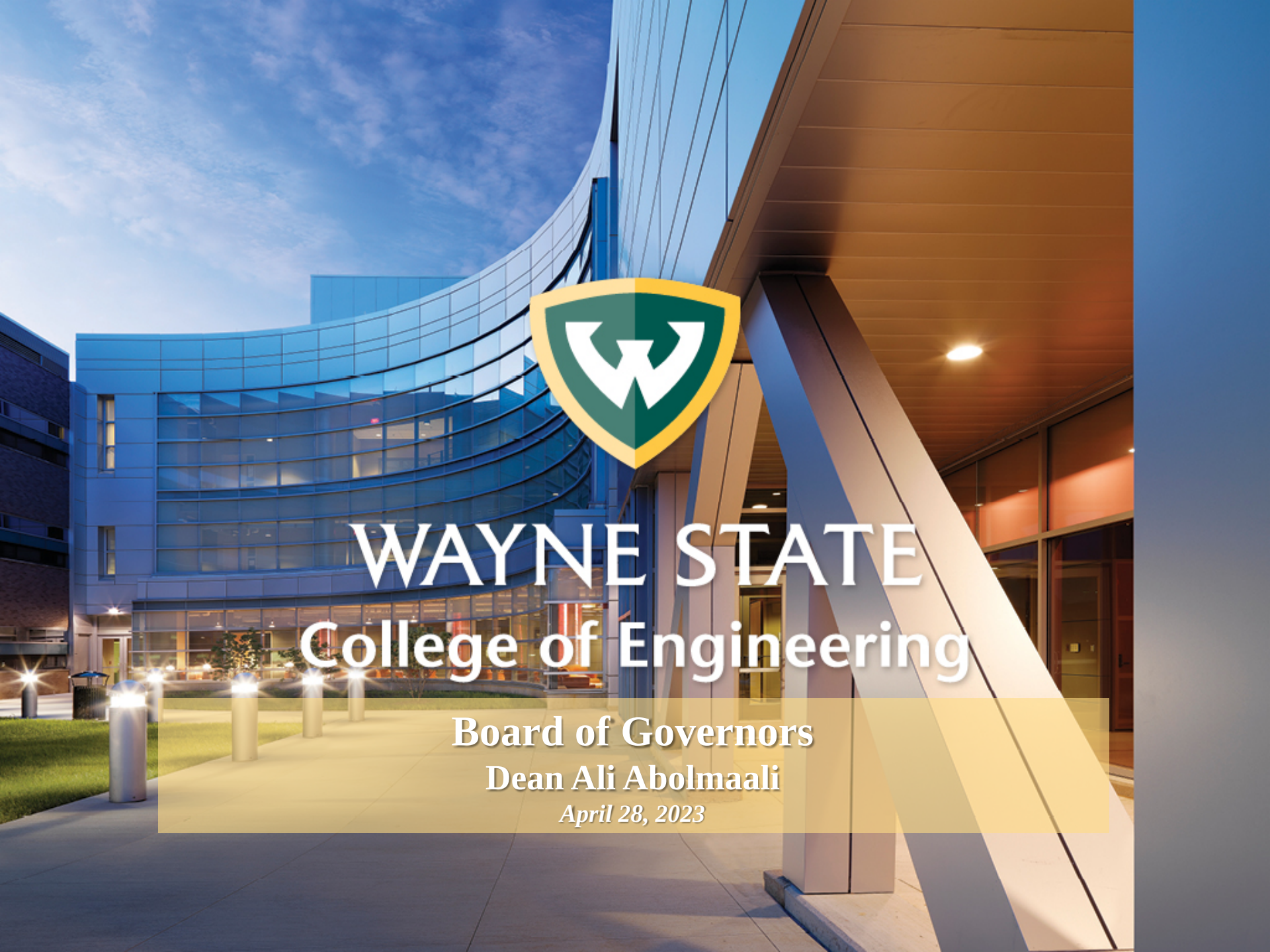


Board of Governors

Dean Ali Abolmaali

April 28, 2023

One of the Most Comprehensive Colleges of Engineering in the Nation

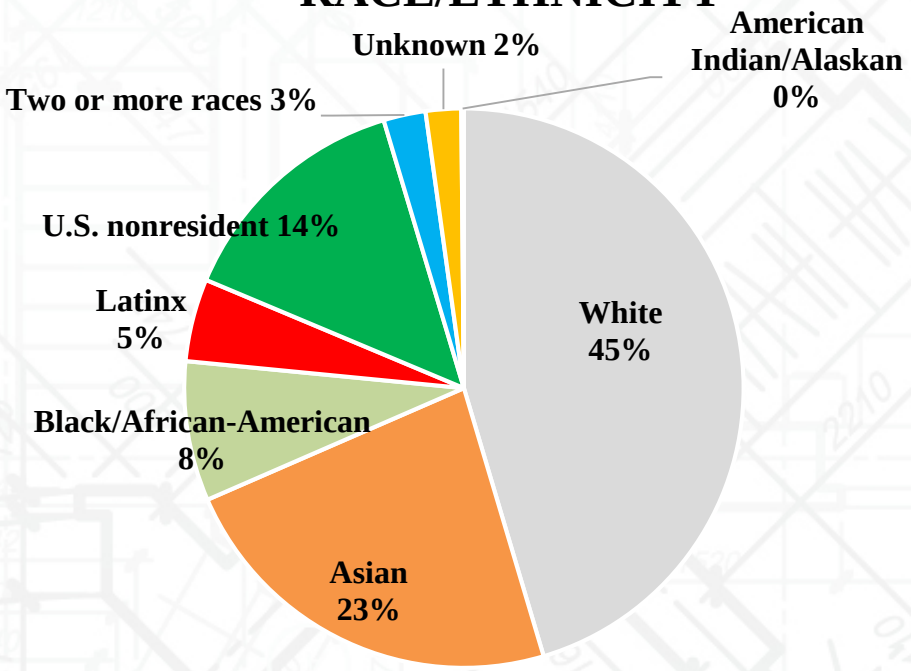
- Eight [8] Academic Departments
- Over 50 Degree Programs

About the College of Engineering

TOTAL ENROLLED

3,368

RACE/ETHNICITY



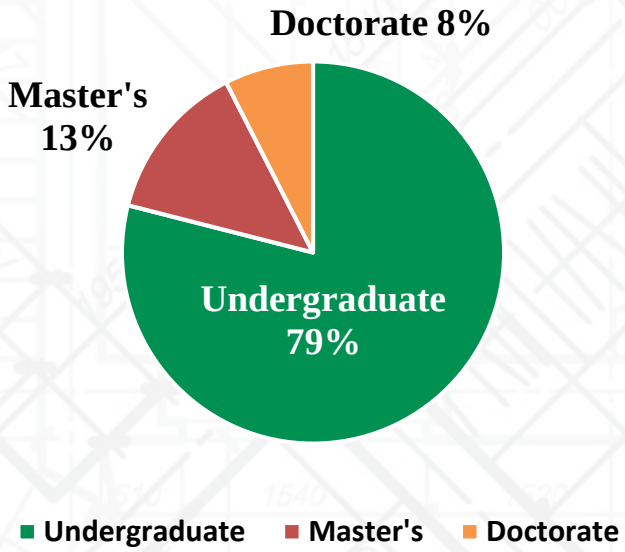
- Wayne State is the **only urban research university in Michigan**
- Partner with Michigan State University and the University of Michigan in the University Research Corridor, **one of the nation's top academic research clusters**
- More than **50 degree programs** including six new online M.S. programs
- Over **30,000 WSU College of Engineering alumni** worldwide
- National model for **student success** (six-year graduation rate of 61.4%)
  - 8.7 percentage point increase over last year
  - 141% improvement in the last decade from 25.5%
- Awarded **705 degrees** in 2022

About the College of Engineering

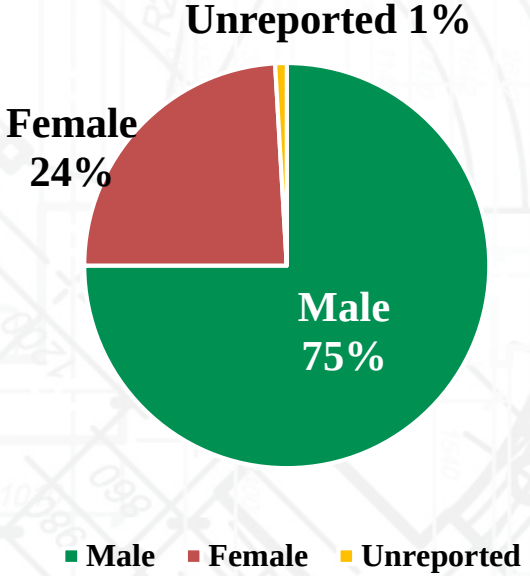
TOTAL ENROLLED

3,368

LEVEL



GENDER



WAYNE STATE UNIVERSITY

Fall 2022
Enrollment Data
COLLEGE OF ENGINEERING
TOTAL ENROLLED: 3,368

Diversity

- **24.1% of students are Female**
  - Above the national average
- **167% increase in Latinx** students since 2012
- **39% increase in Female African-American** students since 2014

Graduation and Retention

- Retention rates continue to increase in the fourth year
- Graduation rates among the top three at WSU

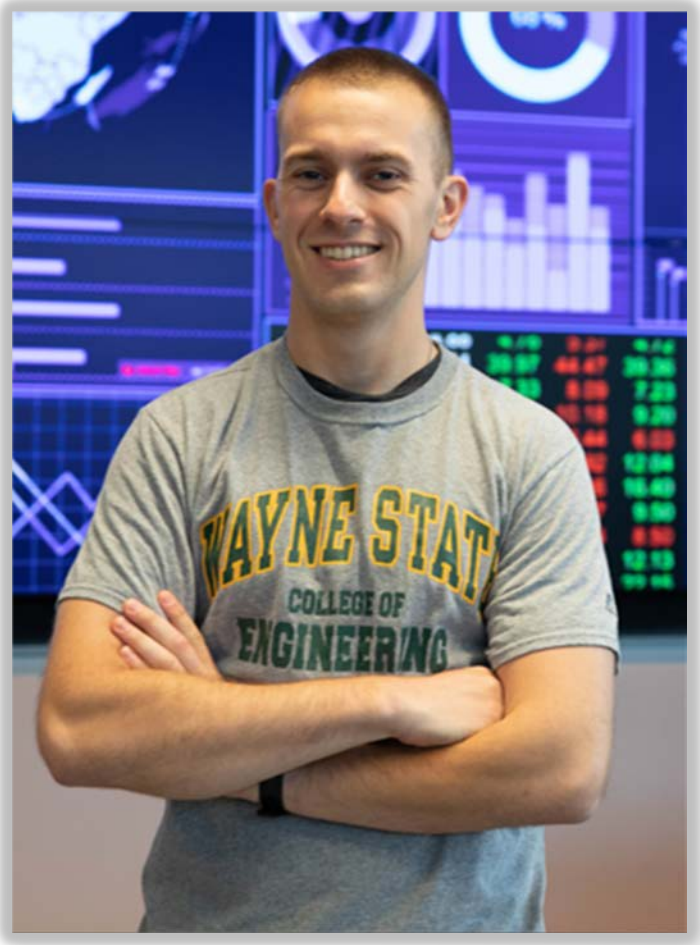
FTIAC Retention Rate

- **81.2% Black or African-American**
- **61.5% Latinx**

WAYNE STATE UNIVERSITY

Undergraduate Programs
COLLEGE OF ENGINEERING

- Biomedical Engineering
- Chemical Engineering
- Civil Engineering
- Computer Science
- Computer Technology
- Construction Management
- Electrical/Electronic Engineering Technology
- Electrical and Computer Engineering
- Electromechanical Engineering Technology
- Industrial Engineering
- Information Technology
- Mechanical Engineering
- Mechanical Engineering Technology
- Welding and Metallurgical Engineering Technology



WAYNE STATE UNIVERSITY

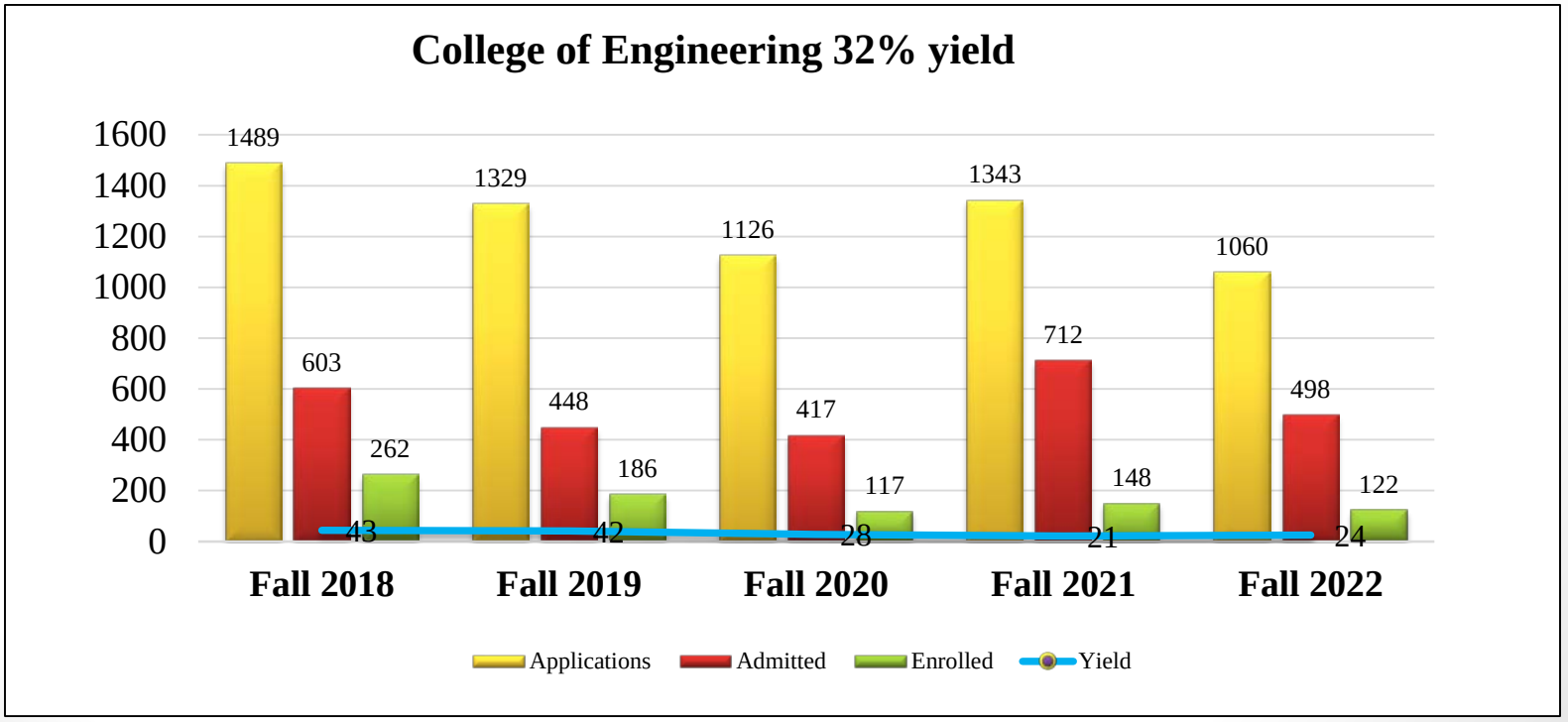
Master's Programs
COLLEGE OF ENGINEERING

- **Alternative Energy Technology**
- **Artificial Intelligence**
- Biomedical Engineering
- Chemical Engineering
- Civil Engineering
- Computer Engineering
- Computer Science
- Data Science and Business Analytics
- Electrical Engineering
- **Electric-Driven Vehicle Engineering**
- Engineering Management
- Engineering Technology
- Environmental and Sustainability Engineering
- Industrial Engineering
- Injury Biomechanics (Online)
- **Manufacturing Engineering**
- Materials Science and Engineering
- Mechanical Engineering
- Professional Engineering Management Master's Program (EMMP)
- **Robotics**

WAYNE STATE UNIVERSITY

College of Engineering
Fall 2022-Present

- Strong Campaign: Increasing MS students
  - 300-400 New Students [Fall 2023]



- **Six [6] New Online Degree Programs- Industry Input**
  - **Artificial Intelligence**
  - **Construction Management**
  - **Energy Storage and Vehicle Science**
  - **Injury Biomechanics**
  - **Robotics and Industrial Automation**
  - **Semiconductor Engineering**

- **B.S. in General Engineering**
  - **Shorelight 3+1 Transfer Students**
    - **[200-300 Students]**
  - **St. Clair College, Windsor**
- **Engineering Clinic**
- **Implementation of Internship in BS and MS Degree Programs**

- **Implemented Faculty Incentives to Increase Research**
- **Faculty Course Off-Load up to Six Months**
  - **Faculty: 50%**
  - **Departments: 25%**
  - **College: 25%**

College of Engineering
Fall 2022-Present

- Engineering Clinic
- Implementation of Internship in BS, MS, and Ph.D. Degree Programs
- Implementation of Faculty Incentives to Increase Research

Fall 2023 Enrollment Data

(as of April 12, 2023)

Number of students registered this year as compared to the same time last year

All WSU Students, New and Continuing

Class Level	FA 2023	FA 2022	# diff	% diff
Undergraduate - FTIAC	32	11	21	190.9%
Undergraduate - Lower Division	454	380	74	19.5%
Undergraduate - Upper Division	775	713	62	8.7%
Graduate - Masters	97	88	9	10.2%
Graduate - Doctoral	7	9	-2	-22.2%
Total	**1,365**	**1,201**	**164**	**13.7%**

Students New to WSU

Population	FA 2023	FA 2022	# diff	% diff
FTIAC	32	11	21	190.9%
Transfer	23	21	2	9.5%
Graduate	23	10	13	130.0%
Total	**78**	**42**	**36**	**85.7%**

Fall 2023 Registration

1,365

total students

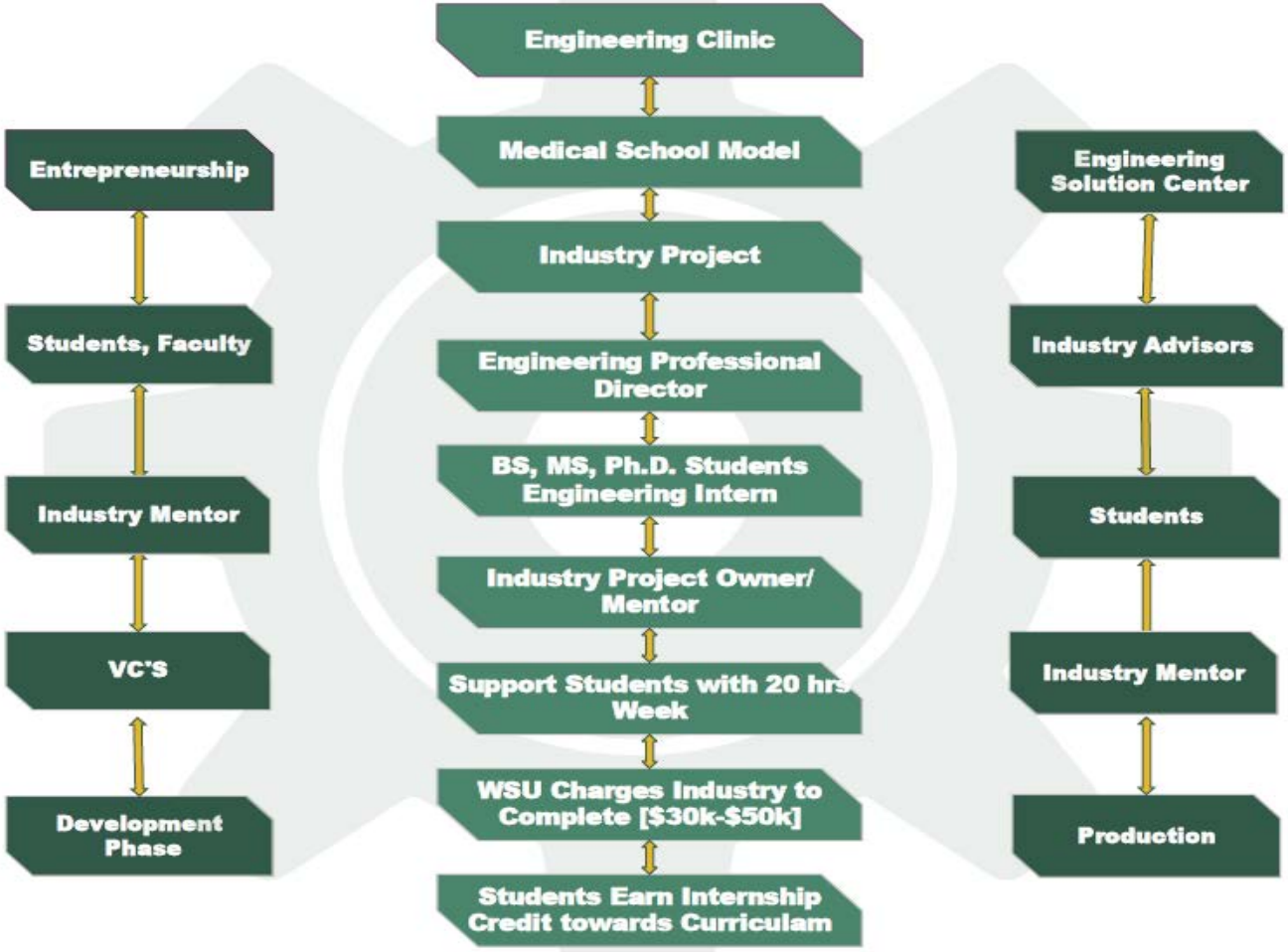
Note: comparison date is the number of days prior to census capture. Source: WSU_CENSUS_HISTORY

Building Partnerships with other Institutes

- University of Engineering and Technology Roorkee, India
- Chang Gung University, Taiwan
- Manipal Institute of Technology, India
- The ICFAI Foundation for Higher Education, Hyderabad, India
- Jiangsu University, China
- Maharaja Ranjit Singh Punjab Technical University, India
- The ICFAI University Tripura, India
- Mohan Babu University, India
- Lovely Professional University, India

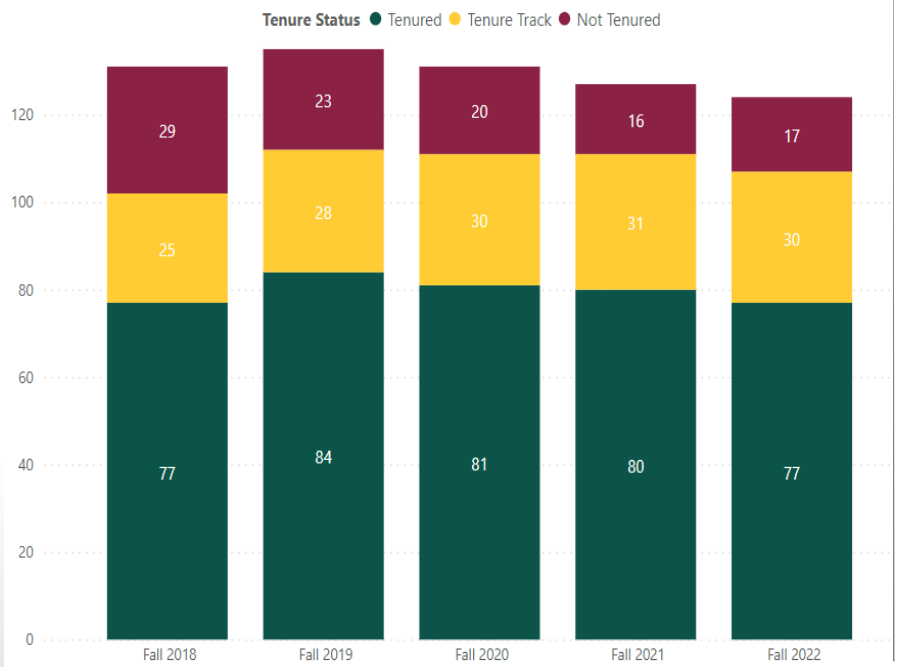
Anderson Institute

AI Full-Time Director
AI Assistant

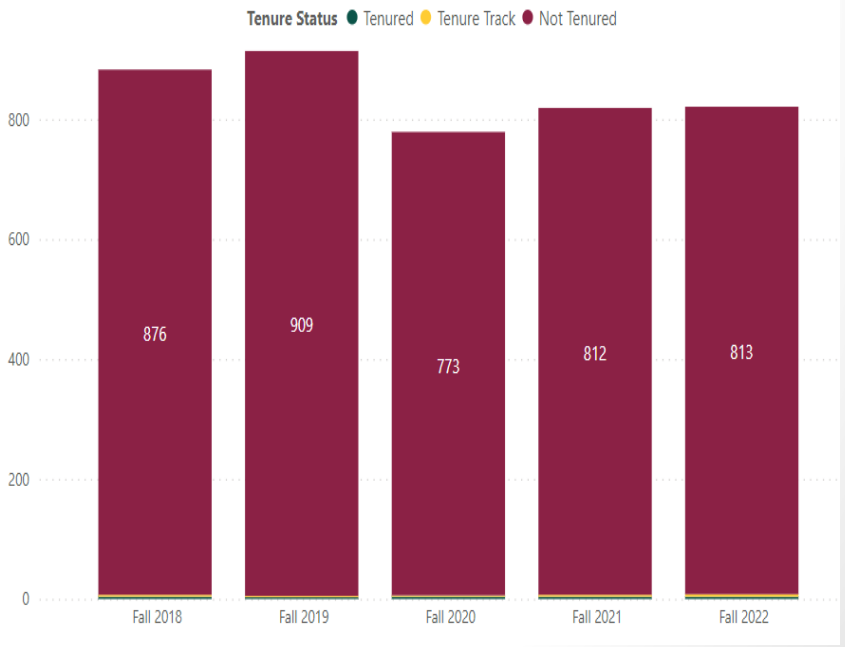


Five-Year Trend
Engineering Faculty

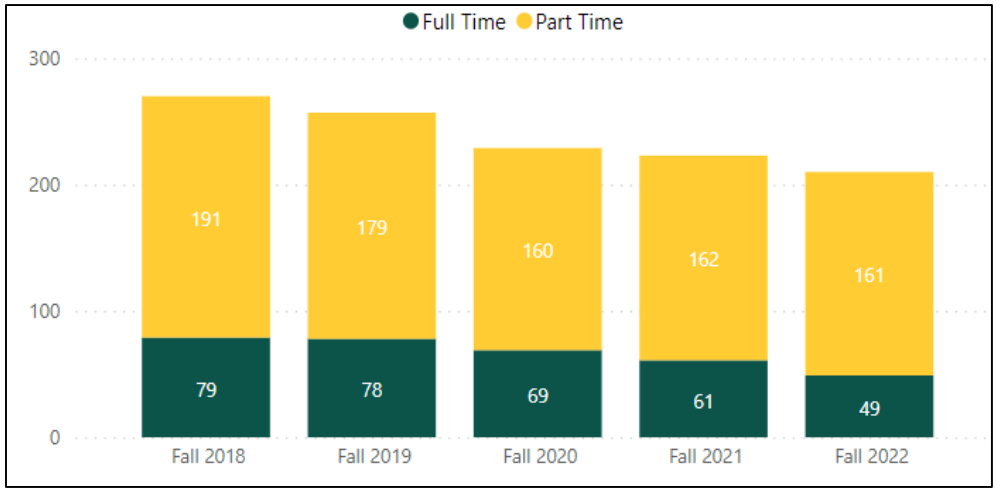
Full-Time Faculty Overview

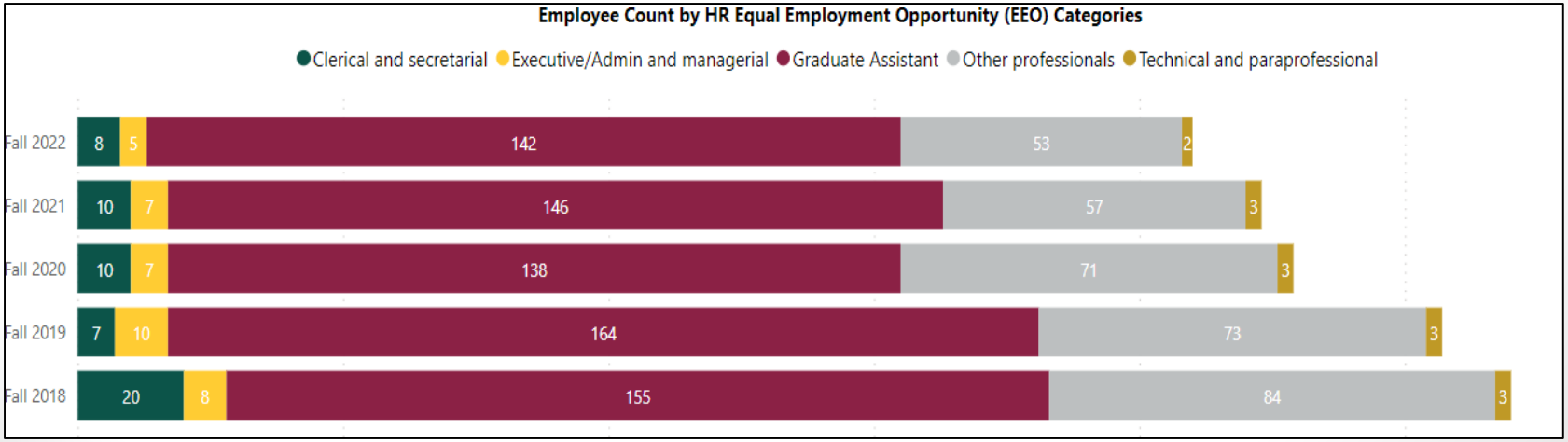


Part-Time Faculty Overview, Instructional and Non-Instructional

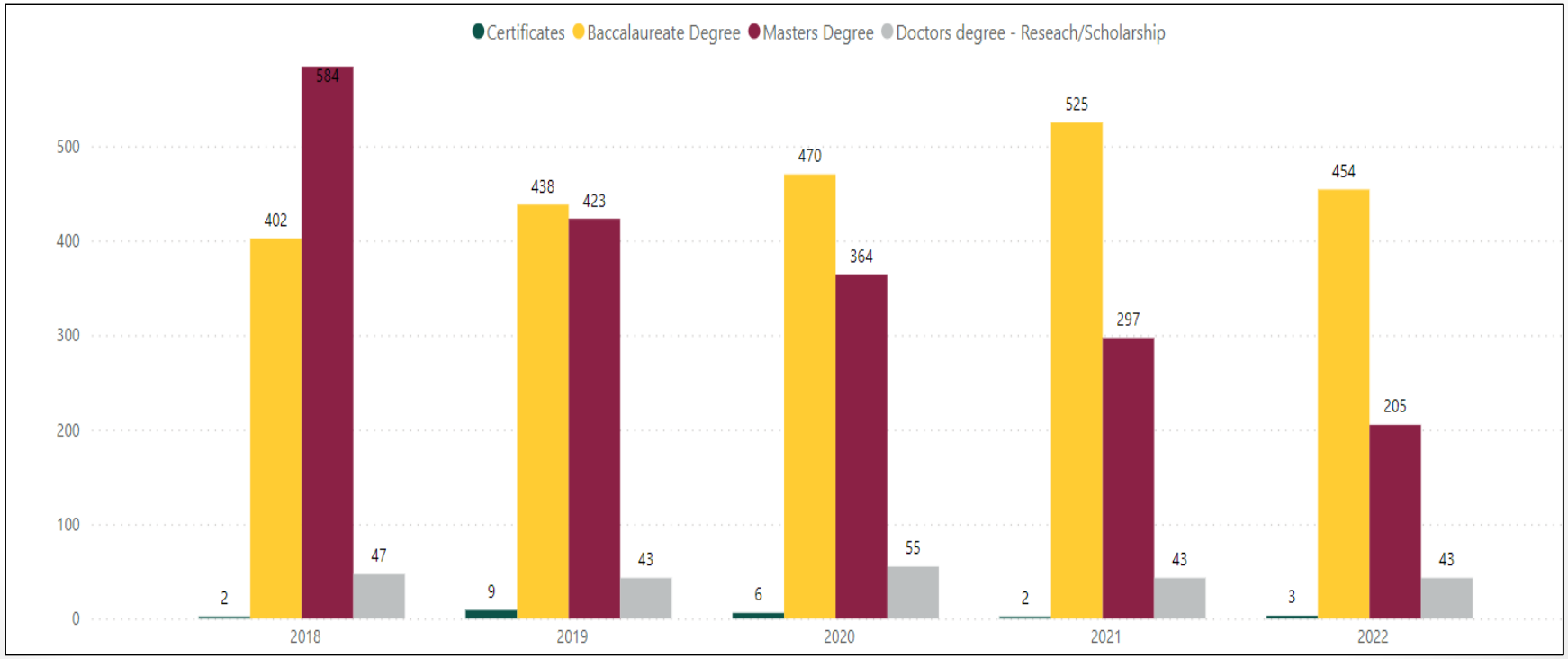


Five-Year Trend Administrative Staff

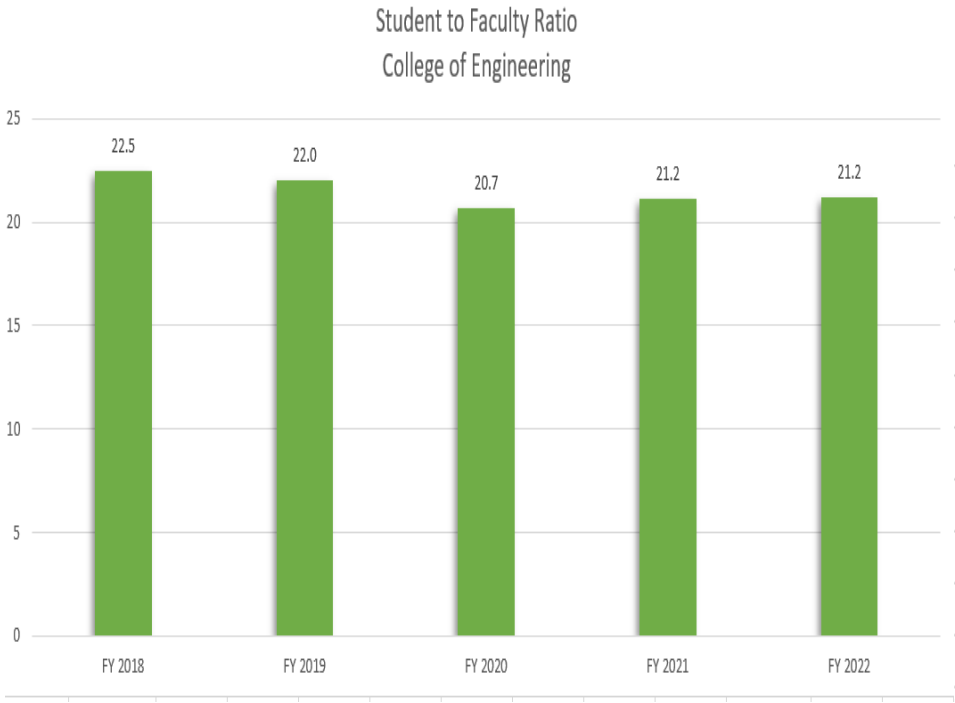




Degrees Awarded by Level



5 Year Trend



Fiscal Year Equated Students divided by Fall Full Time Faculty Headcount

Notes:

FYES is defined based on HEIDI definition:

UG: 1 FYES=30 Credit hours;

MA: 1 FYES=24 Credit Hours;

Doctoral Research: 1 FYES =16 Credit Hours;

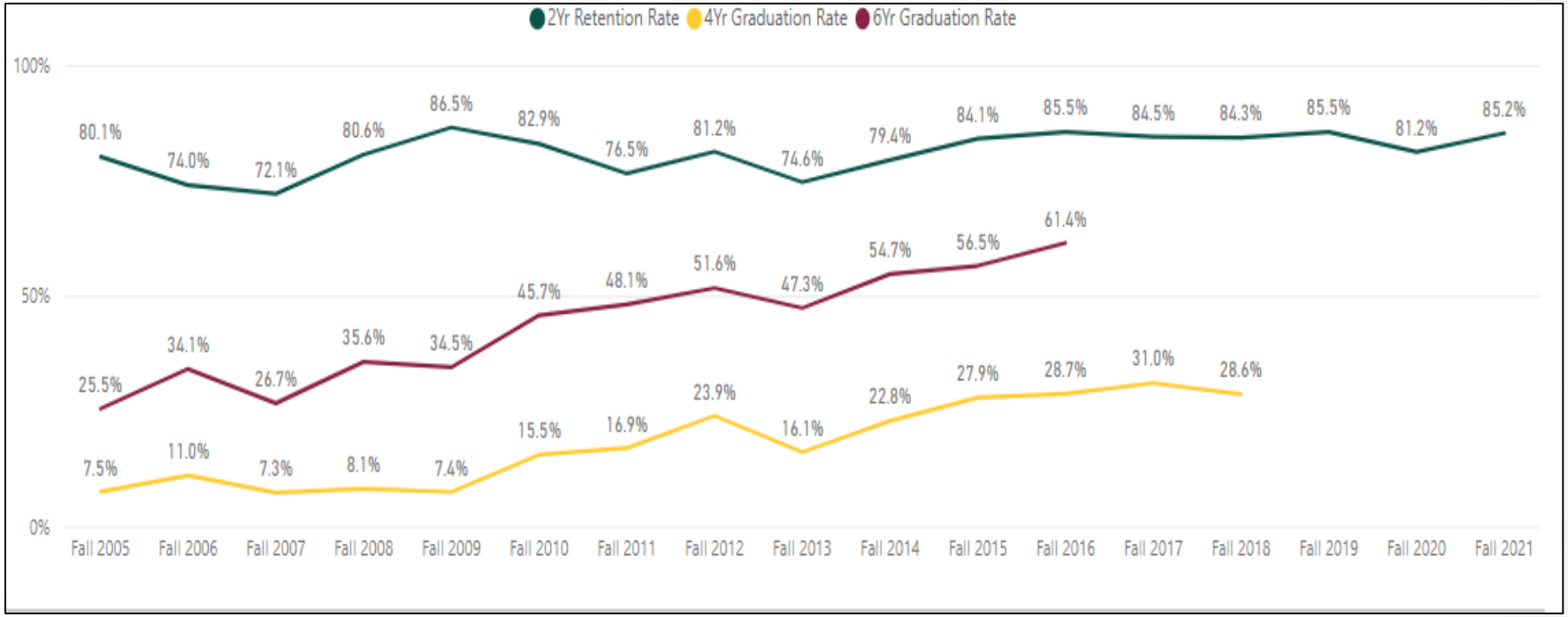
Doctoral Professional: Fall and Winter Headcount divided by 2; plus spring/summer headcount divided by 2

Doctoral Professional includes programs: 'DNP','JD','MD', 'PHARMD','DPT'

Graduate School students have been moved to other colleges, depending on major.

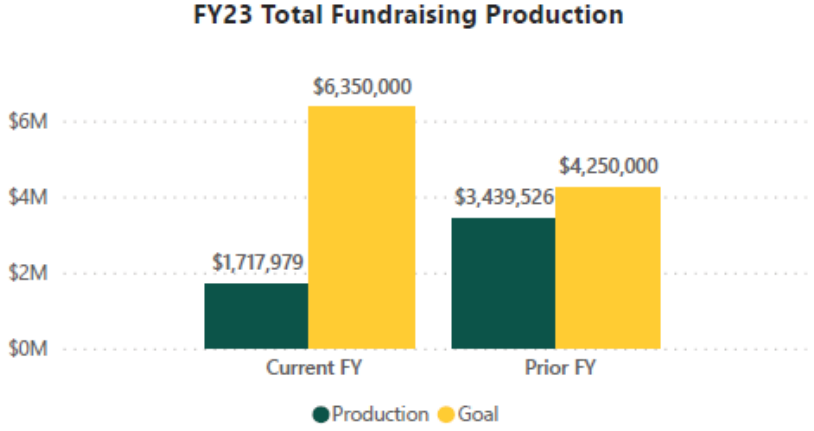
Computer Science Faculty have been moved to College of Engineering from CLAS prior to FY 2012.

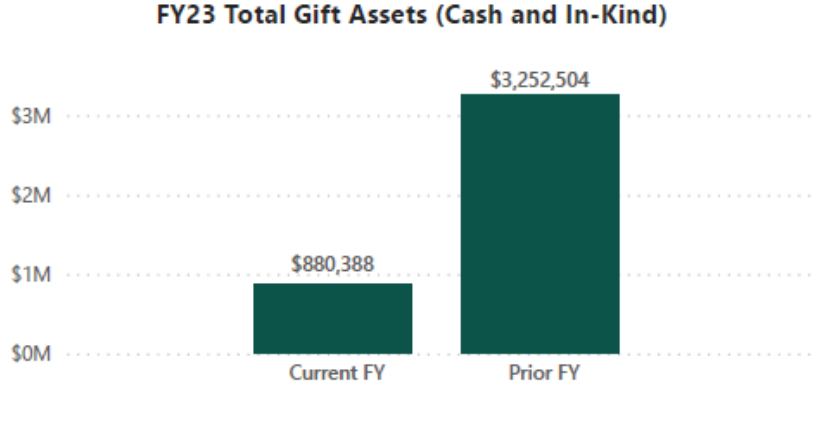
Retention and Graduation Rates

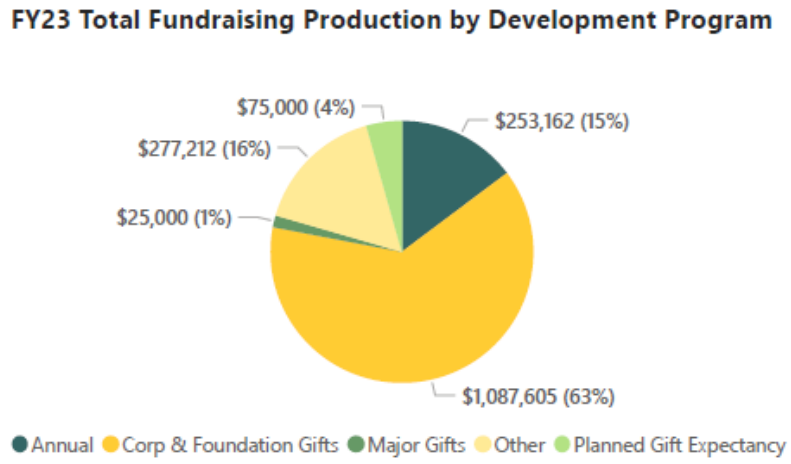


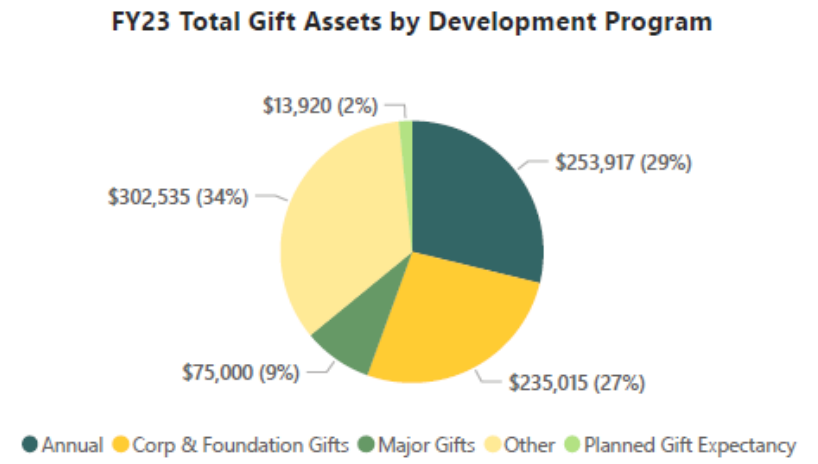
WAYNE STATE UNIVERSITY

College of Engineering
FY23 Fundraising









College of Engineering Sponsored Research

Department	Federal (National)	State	Local	Foreign	Industry	Private/NP	Univ/ Donations	Total	# of awards/ accts
Dean's Office - 05A	$ 199,224	$ -	$ -	$ -	$ -	$ 145,342	$ -	**$ 344,566**	7
Chemical - 05B	$ 1,484,130	$ -	$ -	$ -	$ 202,949	$ 510,297	$ 242,757	**$ 2,440,132**	39
Civil - 05C	$ 1,510,270	$ 366,958	$ -	$ -	$ 184,082	$ 681,311	$ 66,575	**$ 2,809,197**	36
ECE - 05D	$ 169,493	$ -	$ -	$ 250,812	$ 200,772	$ 193,489	$ 13,459	**$ 828,025**	33
ET - 05F	$ 159,336	$ -	$ -	$ -	$ 30,031	$ 88,550	$ 739	**$ 278,656**	8
ISE - 05G	$ 340,984	$ 30,655	$ -	$ -	$ -	$ 713,582	$ 100,929	**$ 1,186,151**	12
ME - 05H	$ 104,523	$ -	$ -	$ -	$ 91,031	$ 63,763	$ 88,816	**$ 348,133**	7
BME - 05K	$ 1,070,132	$ -	$ -	$ -	$ 304,219	$ 181,182	$ 108,794	**$ 1,664,327**	13
CS 12K	$ 1,296,070	$ 13,731	$ 29,058	$ -	$ -	$ 294,412	$ 50,538	**$ 1,683,809**	36
	$ 6,334,162	**$ 411,344**	**$ 29,058**	**$ 250,812**	**$ 1,013,084**	**$ 2,871,928**	**$ 672,606**	**$ 11,582,995**	191

WAYNE STATE UNIVERSITY

Batteries and Energy Systems

Curriculum

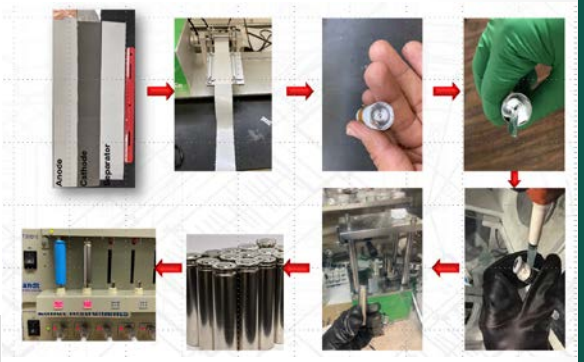
- Masters in Electric-Driven Vehicle Engineering
- MSME Energy Storage and Vehicle Science (Online)

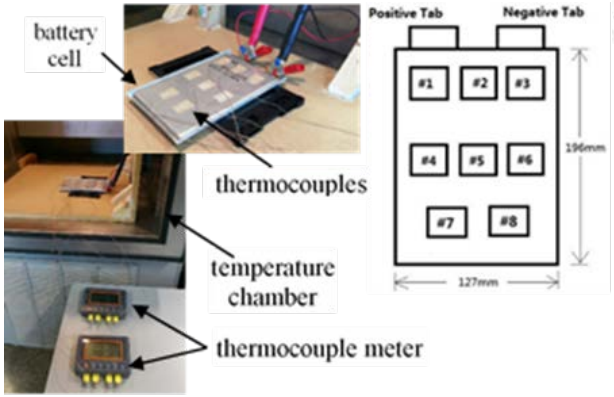
Hands-on Training

- Battery fabrication & testing
- Battery safety & thermal management
- Cell failure analysis
- Certificate Program in Battery Technology

K – 12 Engagement

- Mobile lab on-site for high schools & middle schools
- Summer internship programs





Leela Arava
Battery Materials

Caisheng Wang
Power Electronics

Mahbub Islam
Computational Studies

Elaine Zhu
Polymer Electrolytes

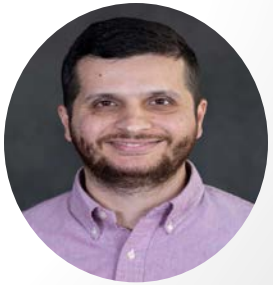
Abbas Nazri
Battery Chemistry

Masoud Nazari
Machine Learning

Semiconductor Engineering

NSF MRI Award: Nanoscribe Quantum QX Shape Nano 3D Printer

- High-speed 3D Printing with 150 nm Resolution
- **WSU is 1st to install in North**



Amar Basu
Wearable Sensors

Mohammed Ismail
Integrated Circuits

Gozde Tutuncuoglu
Nanoscale Devices

Yong Xu
MEMS

Dimitrios Sounas
Circuit Design

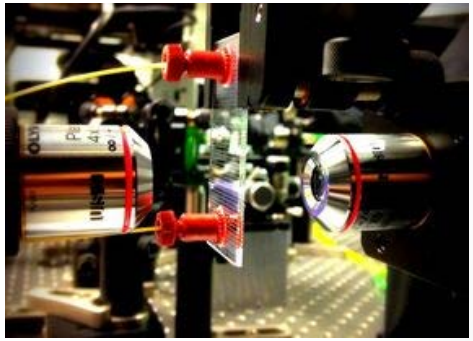
Mohammad Alhawari
Circuits

WAYNE STATE UNIVERSITY

Health Engineering and Informatics

Curriculum

- Bachelor of Science in Biomedical Engineering
- Master of Science in Biomedical Engineering
- MSBME Injury Biomechanics (Online)



Research

- Biomedical Imaging and Instrumentation
- Computational and Systems Biology
- Injury and Musculoskeletal Biomechanics
- Tissue Engineering and Biomaterials

Zhiqiang Cao
Cancer & Diabetes Treatment

Liying Zhang
Injury Biomechanics

Ulrike Klueh
Diabetes Technology

Harini Sundararaghavan
Tissue Engineering

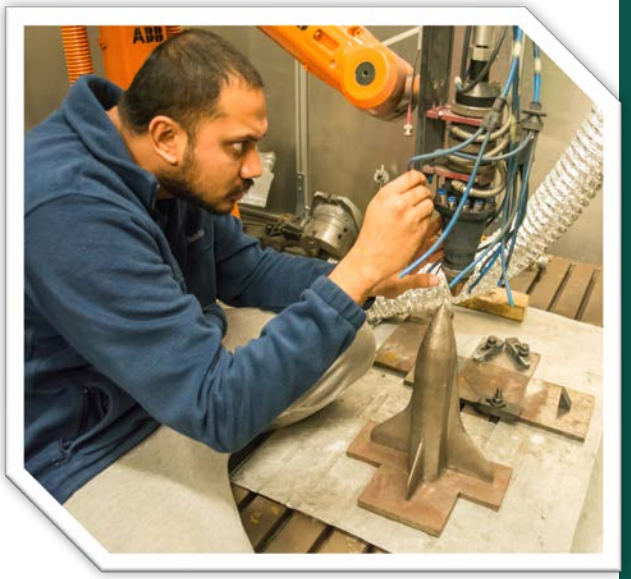
Carolyn Harris
Neurological Conditions

Jitao Zhang
Biomedical Optics

WAYNE STATE UNIVERSITY

Materials and Smart Manufacturing

- Partner in the national manufacturing consortium LIFT (Lightweight Innovations for Tomorrow)
- Key member of Advance Michigan, an Investment in Manufacturing Communities Partnership program
- WSU faculty members are experts in (and collaborate across disciplines on) such technologies as:
  - Nano-Micro Manufacturing
  - Thermal-Mechanical Processing
  - Automation in Manufacturing
  - Lightweight (Composite) Materials
  - Design for Sustainability



Kyoung-Yun Kim
Digital Manufacturing

Helen Durand
Predictive Control

Golam Newaz
Nanocomposites

Yinlun Huang
Sustainability

Qingyu Yang
Intelligent System

Jeremy Rickli
Re-Manufacturing

WAYNE STATE UNIVERSITY

Civil and Environmental Engineering

- Focus on the urban environment throughout the Civil Engineering program
- Strong connections to civil engineering throughout the state of Michigan
  - Substantial funding from the Michigan Department of Transportation
  - Adjunct faculty who are principals in their own civil engineering firms
- Links the theory of the classroom to the real world
- Construction Management, Environmental Engineering, Geotechnical Engineering, Structures, and Transportation Engineering

Carol Miller
Healthy Urban Waters

Timothy Dittrich
Contaminant Modeling

Yaoxian Huang
Climate Modeling

Shawn McElmurry
Water and Health Infrastructure

Yongli Wager
Water Treatment

WAYNE STATE UNIVERSITY

INDUSTRYX
CENTER FOR OPERATIONAL EXCELLENCE

Center for Operational Excellence and Resilience

VISION

- *Foster acceleration of operational excellence*
- *Prepare the workforce of the future*
- *Promote innovation through a collaborative ecosystem of industry, academia, government, and community*

KEY OBJECTIVES

- Incubate ideas into breakthrough technology and analytic solutions for industry pain points
- Promote operational excellence
- Create a learning ecosystem to develop next-generation workforce
- Empower the next generation of leaders
- Enhance diversity, equity, and inclusion

INDUSTRYX PILLARS

R&D Alliance + Solution Development

Build Economic Prosperity and Resilience with Industry Partnership

Next Gen Incubation Labs

Test Ideas for Innovation and Experience Technologies

Education + Workforce Development

Develop an Inclusive and Equitable Workforce of Future

Thought Leadership

Promote Thought Leadership and Learning Community

THANK YOU!

Wayne State College of Engineering
Engineering Choice of Michigan and Beyond