



*Building Expansion Rendering (East Approach)*

**BUILDING THE FUTURE**

*COLLEGE OF AERONAUTICS  
AND ENGINEERING*

**Preparing Students for Business, Manufacturing and Aviation**

The College of Aeronautics and Engineering (CAE) is producing agents of change. Passionate students experience immersive instruction that will prepare them to compete in a rapidly changing global economy. Our academic program is supported by cutting-edge research and state-of-the-industry facilities designed to prepare students in the fields of aerospace engineering, mechatronics engineering and cybersecurity engineering, all of which are vital to business, manufacturing and aviation.





Building Expansion Rendering (First Floor Atrium)

# Growing Demand for Engineers

The workforce is in great need of highly skilled engineering professionals, and the CAE is positioned to address that void. In order to meet the demand, the college needs additional lab, office and classroom space in the Aeronautics and Engineering Building on the Kent Campus.

The U.S. Bureau of Labor Statistics predicts significant growth in the demand for engineers in the coming decade, and companies will struggle to fill these positions. The CAE is tackling this workforce gap while leading the way in the development of unique and innovative programming.

## OUR VISION

The College of Aeronautics and Engineering strives to be recognized as a global leader, embracing a unique synergy of aeronautics, engineering and technologies. Our goal is to inspire our diverse student population to innovate, impact and improve life, making the universe more accessible and the opportunities unlimited. Our research leverages the unique synergy of aeronautics and engineering to enable innovative engineered systems for a smarter, more secure and sustainable future.

“We’ve created a unique academic experience for our students through the intentional synergistic engagement of aeronautics, engineering and technology disciplines. Graduates of our programs are trained to find opportunities in uncertainty, as they learn through collaboration and perseverance to face our unpredictable world head-on. Private support to expand our physical space on campus, while also expanding our laboratory facilities, will have an exponential return on investment, qualifying our graduates to turn today’s challenges into tomorrow’s successes.”

- **Christina L. Bloebaum, Ph.D., Dean**  
**College of Aeronautics and Engineering**

# Sydney Bihn, '20

Aerospace Engineering  
Sylvania, Ohio



Sydney Bihn began her Kent State experience as a middle childhood education major with a concentration in math and science. Midway through her junior year, she chose to switch to aerospace engineering. “I just had this feeling inside that maybe there was something else I would be passionate about, enjoy more and also be incredibly challenging,” she said. In May 2020, she became the first woman to graduate from Kent State’s Aerospace Engineering Program, becoming a third-generation engineer in her family.

It all clicked for her while shadowing several professional engineers. “This could be a career path that would allow me to use my passion for mathematics and also challenge me to apply it to the real world,” Sydney said. “I absolutely made the right choice by switching majors because I have had some of the most incredible experiences in my life.”

“As women in the industry, we have self-doubt, but we just need to reflect on our own achievements and be proud of them and use that as a confidence booster,” she said.

In 2019, Sydney was selected as a Brooke Owens Fellow, a program that provides women who are passionate about aerospace with internships in top companies and mentors

who are executive-level women in the industry. “Having this network with women in engineering, and in aerospace engineering in particular, is incredible,” she said. “And the opportunities and connections with people across the country who work on really cool projects has been a game changer for me.”

“You need to take risks and put yourself out there in order to show that you are capable, talented and deserving of the title of engineer,” Sydney said. “It’s very exciting to be in an industry where there are so many new challenges to accomplish things that just have never been done before. And the opportunity to be a part of a team that could do something that’s never been done before is the dream of an engineer.”

Since graduation, she has been employed in the space systems department at Northrop Grumman, an aerospace and defense company in Gilbert, Arizona.

*The College of Aeronautics and Engineering has grown in both size and stature in recent years. With the addition of notable faculty and related research funding, our impact on future industries will be remarkable.*

**81.5%**

Retention Rate

**\$2.6M**

Awarded in Scholarships

**83%**

Students Receive Scholarships

**52%**

Increase in Enrollment

**3%**

Increase in Women Enrollment

**3.7%**

Increase in Underrepresented Enrollment

**29%**

First-Generation Freshmen Students

**6%**

Increase in Honors College Admissions

**4X**

Growth in Research Funding

**34**

Aircrafts - The Largest Fleet in Ohio

**27**

States Represented by Student Body

**19**

Countries Represented by Student Body

# Enrollment Can Grow Only When the Building Expands

## DRAMATIC ENROLLMENT GROWTH

The expansion will add 44,000 square feet to the existing Aeronautics and Engineering Building. This will add 80 percent more space to accommodate the engineering program's dramatic growth in student enrollment, indicated by a 52 percent increase in the fall 2019 incoming class.

## UNIQUE MULTIPURPOSE SPACE

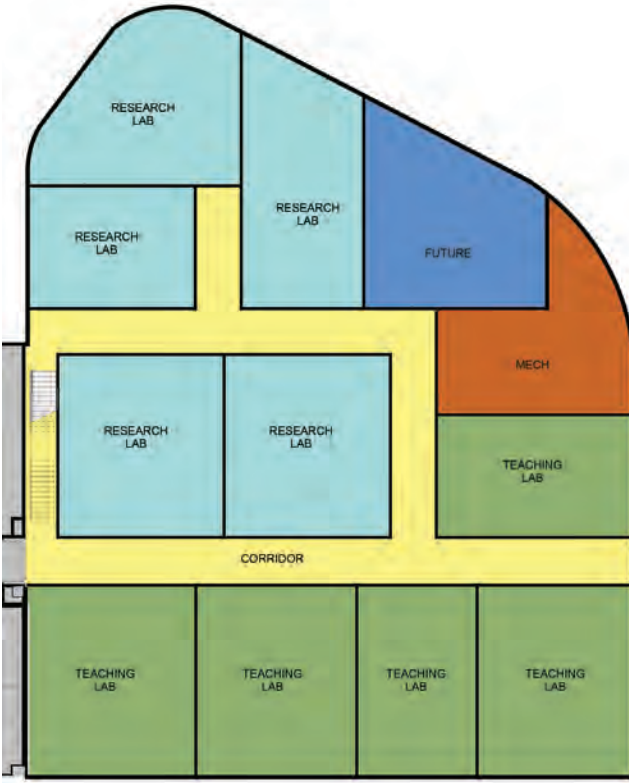
The Timken Foundation of Canton Atrium will tower more than two-stories and serve as a community collaboration space for our students, as well as a venue for the college's events and gatherings. This space will also be utilized for the Unmanned Aircraft Systems Flight Operations program by providing a space to conduct research and fly indoors year-round.

*Building Expansion Rendering (Second Floor)*



# Facility Growth Will Impact:

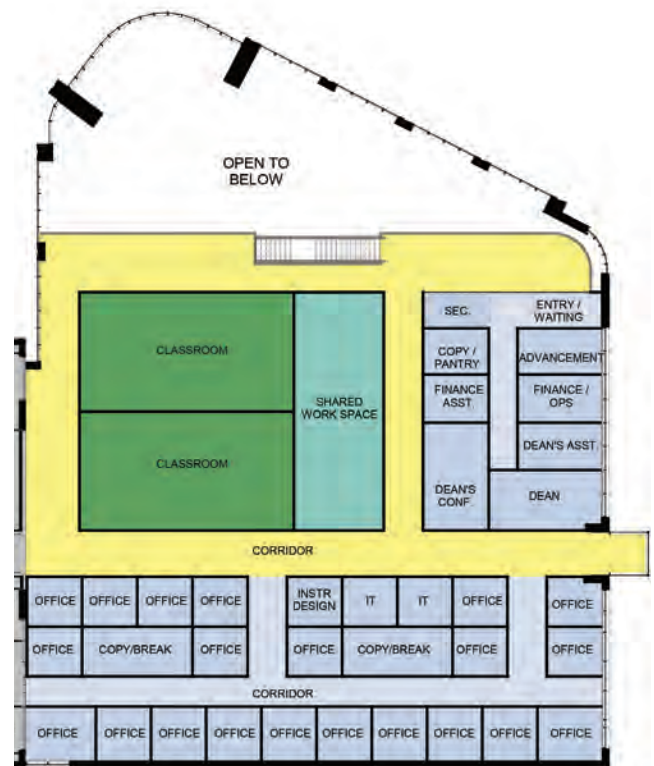
- **Community and Outreach** - Building community and sense of belonging
- **Experiential Learning** - Innovative classroom experiences and experiential learning labs
- **Future Forward** - Faculty and graduate student research labs
- **Student Success** - Academic and career services
- **Student Support** - Administrative services



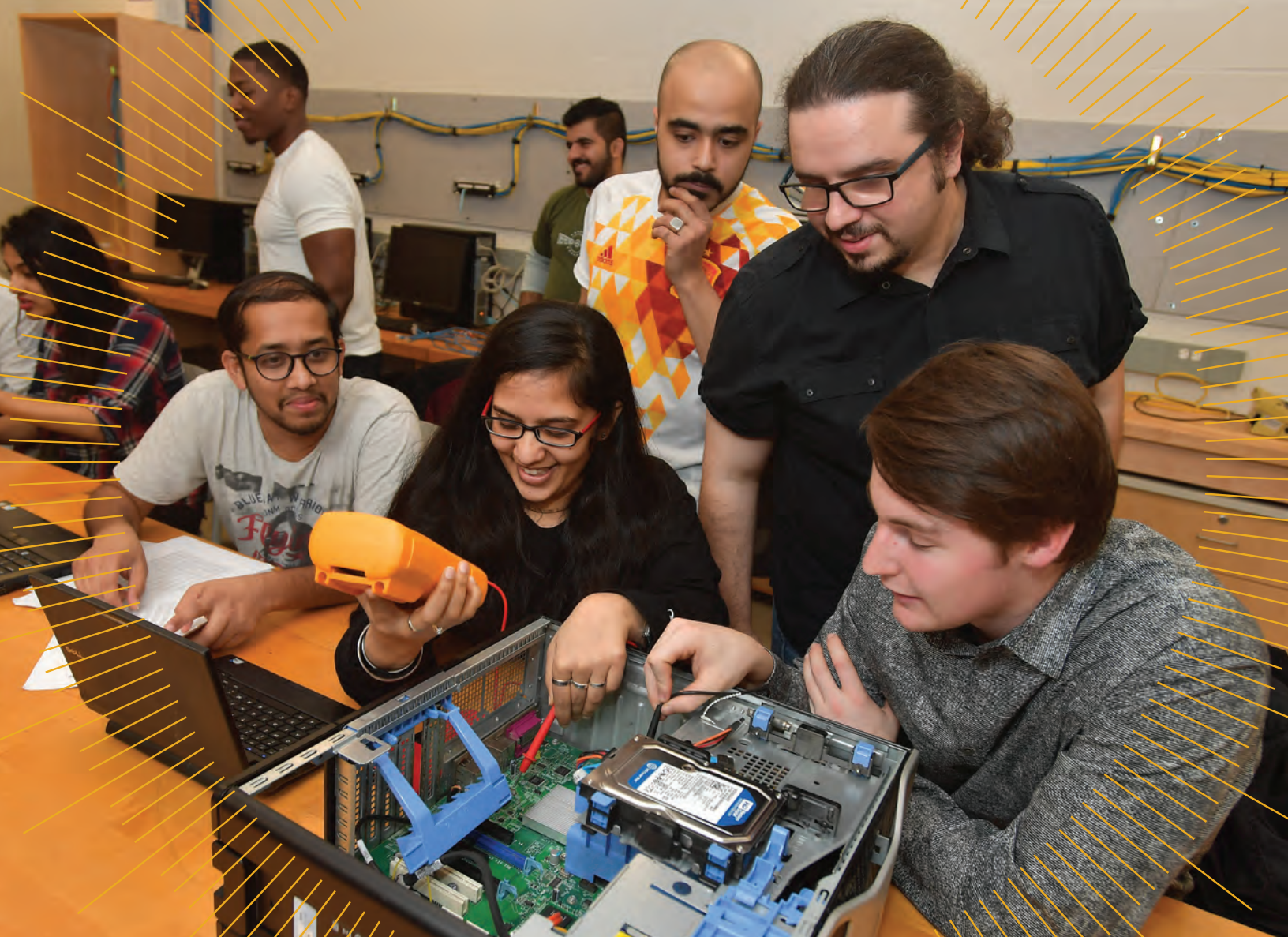
LOWER LEVEL



FIRST FLOOR



SECOND FLOOR



## **PROGRAM SPOTLIGHT**

### **Cybersecurity Engineering, B.S.**

Cybersecurity engineering focuses on the development of computer and network systems that are cyber resilient.

Cybersecurity engineering is a high-growth career in the digital economy. Cybersecurity engineers analyze computer networks to ensure that they're running securely and predict security issues before they occur. These professionals also focus on designing computer systems equipped to deal with disruptions like natural disasters and/or malicious cyberattacks.

The cybersecurity engineering program prepares individuals who want to become professional engineers in the broad field of cybersecurity. The program provides students with a working knowledge of analysis and

evaluation of components and systems with respect to security and to maintaining operations in the presence of risks and threats, with an emphasis on engineered systems. Students gain the understanding and skills necessary to address security issues pertaining to stakeholder needs and requirements (from a systems engineering perspective), considering the life cycle of the system from the outset. Emphasis is placed on design and development of systems, and their components and associated networks to increase trustworthiness. Cybersecurity engineering is a certification-friendly field. This program creates a pathway for students to focus on specializations like penetration testing, network security and web security to name a few.

# Michael Parker, '20

**Mechatronics Engineering/  
Mechatronics Engineering Technology**  
Erie, Pennsylvania

Michael Parker began his Kent State journey majoring in mechanical engineering technology and changed to mechatronics engineering/mechatronics engineering technology to pursue a career as a multidisciplinary engineer. “I initially chose Kent State because I loved the campus and was looking for a program with an emphasis on hands-on learning,” said Michael, who received seven scholarships during his Kent State experience. **“The scholarships that I received gave me the financial security I needed to pursue my goal of becoming an engineer,”** he said.

Michael believes Kent State’s mechatronics engineering and mechatronics engineering technology programs are unique. “Mechatronics is special because it encompasses more than one discipline of engineering. Those who understand concepts and possess skills in different disciplines become flexible in what they can do and have the ability to communicate effectively between these disciplines in a professional work environment,” he said. “The KSU program has interactive classrooms such as the Rockwell Automation Lab and the FANUC Robotics Laboratory that enable students to physically interact with industrial equipment.”

As president of the Kent State Robotics Club, Michael attended the NASA Robotics Mining competition held at Kennedy Space Center. “Joining the robotics team had the biggest impact on my career. I had the opportunity to learn and experience so much by being involved with the organization,” he said. “Every year, our robotics team invites a few universities from the NASA competition to Kent State to practice in our regulation-sized sand pit,” Michael said. “Hosting practice competitions for the NASA Robotic Mining competition was among my most inspirational experiences as a Kent State student.”

Michael interned with Bessamaire, an industrial HVAC company, where he designed sheet metal parts for HVAC units. He also interned with The Goodyear Tire and Rubber Company doing process development with their innovation team. He has been employed as a mechatronics engineer with Goodyear since graduation.



## **PROGRAM SPOTLIGHT**

### **Mechatronics Engineering, B.S.;** **Mechatronics Engineering** **Technology, B.S.**

Mechatronics is a multidisciplinary field of engineering that integrates mechanical, electrical, computer and control systems.

Today, almost everything is a mechatronic system – from the ATM at the grocery store, to the robots that are building your car and making its tires, to the innumerable processes and technology that have become a way of life. Using automated systems reduces labor costs, increases precision and accuracy, and provides quality products and safety for workers.

CAE’s mechatronics programs prepare individuals to become engineers in the broad field of manufacturing. Mechatronics engineering revolves around the design, construction and operation of automated systems, robots and intelligent products that result from the integration of software and hardware. Students gain knowledge, skills and obtain industry credentials necessary to address continuously evolving technology advancements. The mechatronics engineering program is more theoretical and focuses on design and calculation, whereas the mechatronics engineering technology program is hands-on and focuses on managing, implementing and applying concepts.



# WHY IS PHILANTHROPIC SUPPORT NEEDED?

Philanthropic support is more than simply important; it is essential if we are to make this vision a reality. We are engaging in an innovative philanthropic campaign to secure the remaining funds necessary to complete construction.

## PROJECTED FUNDING FOR ENGINEERING WING:

- Total estimated cost - \$18 million
- External funds committed - \$12 million
- Philanthropic gifts required - \$6 million

The bottom line is simple: We need supporters who share our understanding of the facility's importance - and our vision for the College of Aeronautics and Engineering's dynamic future - to lean forward and say "yes" to a project that is important and transformative. This will impact our current students and faculty, our alumni and the future of aeronautics and engineering both in Ohio and across the globe. We need your support to make our future *Forever Brighter*.

Donations will be recognized in a manner of your choosing with approval of the University Board of Trustees and may be made in honor or memory of yourself, your family or your business.

---

For more information or to discuss a philanthropic gift,  
please contact us at [cae@kent.edu](mailto:cae@kent.edu) or 330-672-2892.

[www.kent.edu/supportaeronauticsengineering](http://www.kent.edu/supportaeronauticsengineering)



College of Aeronautics  
and Engineering

[www.kent.edu/foreverbrighter](http://www.kent.edu/foreverbrighter)



# RESEARCH IMPACT

Research in the College of Aeronautics and Engineering (CAE) is growing dramatically. CAE research leverages the unique synergy of aeronautics and engineering to enable innovative, engineered systems. In turn, those systems ensure a smart, more secure and sustainable future that improves life and makes the universe more accessible to all.

“CAE researchers are tackling many challenging problems of global importance. The need for sustainable energy and manufacturing solutions, the design and integration of autonomous systems, and the ability to secure the nation’s cyber systems are areas of expertise for our faculty. These timely topics have caught the attention of the media, making the work we do highly relevant. Our cutting-edge research compels other institutions to partner with us, allowing us to lead in creating groundbreaking discoveries to shape the future.”

- **Joycelyn Harrison, Ph.D., Associate Dean, Research and Faculty Affairs**

## Research Themes

### SMART

CAE’s research in Artificial Intelligence (AI) pushes the boundaries of smart, engineered systems in the air, on the ground, in space and on the manufacturing floor.



### SAFE AND SECURE

Our research addresses real-world problems to enhance human-machine interaction and engineer systems that are less vulnerable to persistent threats.



### SUSTAINABLE

As responsible stewards of the planet, we are pioneering sustainable innovations in energy, materials, manufacturing and design.



### ACCESSIBLE

CAE’s research in aerospace guidance, navigation and control is focused on expanding the boundaries of accessibility from domestic surveillance to space exploration.



# Growing Research

7

New faculty researchers since 2018

4X

Research funds awarded since 2018

\$4.3M

Multi-institutional grants awarded (2019-2020)

1st

Ph.D. program at Kent State University in engineering



## Graduate Program Growth

The Ph.D. in Aerospace Engineering is the first doctoral program in engineering at Kent State University and is a milestone for the college. The new state-of-the-industry laboratories in the proposed engineering wing addition will enable graduate programs and research to expand and flourish.

## Research Productivity

It is our belief that innovation occurs across disciplines. This integrated aeronautics and engineering approach is the foundation of our research initiatives. Our unique and intentional curricular blend cultivates the space to use varying aspects of research techniques and program outcomes to achieve research excellence.

"In the 14th century, humans did not know the existence of other continents. Now, we are discovering evidence of water on Mars and even liquid water on Europa, a moon of Jupiter. What else do we not know? My research uses science and engineering to make space more accessible for both scientific investigation and human exploration."

- Dr. Ye Lu, Assistant Professor, Space Systems Laboratory

[www.kent.edu/supportaeronauticsengineering](http://www.kent.edu/supportaeronauticsengineering)

FOREVER  BRIGHTER™

KENT STATE UNIVERSITY®

[www.kent.edu/foreverbrighter](http://www.kent.edu/foreverbrighter)