



TEXAS A&M
UNIVERSITY



2020

DEPARTMENT OF
**MULTIDISCIPLINARY
ENGINEERING**

LETTER FROM THE DEPARTMENT HEAD



I am excited to announce that the College of Engineering at Texas A&M University has established a new department — the Department of Multidisciplinary Engineering. What an honor it is to pilot the first department of its kind! We feel the curriculum we are continuing to develop will train future engineers to overcome obstacles in a new way and propel us into a future that we cannot even imagine.

Engineering has always been multidisciplinary by its very nature; today, this truth is even more evident. We routinely hear from our industry stakeholders about the essential nature of multidisciplinary-minded engineers. Despite our engineering faculty regularly engaging in multidisciplinary research, the seamless and natural integration of multiple disciplines in an engineering curriculum has been slow. While we train talented mechanical engineers and electrical engineers and nuclear engineers — we don't necessarily train people who can connect the dots among these disciplines as effectively as we should. That's why we decided to transform our interdisciplinary engineering program into a full-blown department.

We have a multifaceted approach to our curriculum creation and degree plans. Undergraduate students can earn a Bachelor of Science in interdisciplinary engineering, following a degree plan that they work with us to develop. Nearly half of this degree is open to flexibility, meaning students can design about half of their curriculum to meet their specific interdisciplinary interests. By focusing on long-term career goals, we can help our students hone in on their interests and focus on the future. We also offer numerous pre-approved degree plans that span multiple disciplines or colleges.

For graduate students, we offer degrees with focus areas in subsea engineering, cybersecurity and systems engineering. Students can also choose to work with us to create a program that spans multiple traditional departments or colleges. Through our partnerships with the College of Medicine and Houston Methodist Hospital, we've established the Engineering Medicine program, through which students can earn an M.D. degree and a Master of Engineering degree.

This is just a small snippet of what we currently offer, and what we have plans to offer. We're excited to be a part of our college's mission to transform engineering education!

Thanks, and Gig 'em!

A handwritten signature in black ink that reads "Timothy J. Jacobs".

Timothy J. Jacobs, Ph.D.

Interim Department Head

Professor, J. Mike Walker '66 Department of Mechanical Engineering

Steve Brauer, Jr. '02 Faculty Fellow

MULTIDISCIPLINARY SOLUTIONS



UNDERGRADUATE DEGREES OFFERED

- **Interdisciplinary Engineering — Design Your Own Degree:** We work with our students to design a degree program that allows them to hone in on specific topics of interest.
- **Interdisciplinary Engineering — Pre-Defined Tracks:** Students pursue faculty-written curricula in interdisciplinary fields such as advanced manufacturing, planetary science and exploration, cybersecurity, engineering in marine environments, safety engineering and many others.

MINORS AND CERTIFICATES OFFERED

Multidisciplinary engineering also offers a wide array of minors and certificates to enhance students' careers no matter their home field of study.

- **Cybersecurity:** Undergraduate minor (engineering, technology and interdisciplinary tracks) and graduate certificate
- **Engineering Project Management:** Undergraduate minor and graduate certificate
- **Engineering Concept, Creation and Commercialization (Entrepreneurship):** Undergraduate certificate and graduate certificate
- **Engineering Concepts Minor:** Undergraduate minor intended for non-engineering students ▼

STUDENT'S PERSPECTIVE



“When I graduated high school and set my sights on attending Texas A&M, I told my classmates that I would be majoring in biomedical engineering to ultimately pursue a Ph.D. in it, address gaps in cancer diagnostic technologies and be a respected professor. But it was the empowerment that comes with designing a program of study, the careful balance of curricular flexibility and faculty oversight, and greater opportunities for entrepreneurship made available by way of a more flexible technical elective track that all led me to my major. I found double majoring would have delayed my graduation by a semester or two, until I realized that I could have them both in interdisciplinary engineering.”

Luke Oaks

Class of '19

INTRODUCING THE DEPARTMENT OF MULTIDISCIPLINARY ENGINEERING, A STUDENT'S PERSPECTIVE

After hearing about the department during an engineering seminar, Susie McCartt jumped at the opportunity to be part of the Department of Multidisciplinary Engineering (MTDE).

“An engineer is comfortable taking risks and choosing their own path,” McCartt said. “By choosing multidisciplinary engineering, you choose to create a program geared toward questions that don't have answers.”

McCartt enjoys the flexibility of this individualized approach to education. By working closely with MTDE staff and faculty to create a degree plan that aligns with her interests, she can choose classes that are tailored to her passions or choose a pre-approved track that is equally diverse.

Through MTDE, students are able to take courses in disciplines outside of engineering, such as education or architecture, to develop a personalized set of skills.

“The ability to integrate non-engineering courses into a degree plan builds on the concept that MTDE students are able to apply an engineer's problem-solving ability to a number of projects that expand across the professional workforce,” McCartt said. “There is no limit to what an MTDE student can achieve.”



MULTIDISCIPLINARY GRADUATE DEGREES



GRADUATE DEGREES OFFERED

- **Subsea Engineering:** This Master of Engineering in engineering degree focuses on subsea engineering, allowing students to gain the skills necessary to design, build, install and operate subsea equipment.
- **Cybersecurity:** Our need for cybersecurity has never been greater. This Master of Engineering in engineering degree allows students to specialize in cybersecurity, preparing them for careers in national defense or the private sector.
- **Systems Engineering:** This Master of Engineering in systems engineering degree focuses on the design, integration, operation and maintenance of large-scale engineering systems in government, military and civil industries.
- **Engineering Medicine:** We've partnered with Houston Methodist Hospital and the Texas A&M College of Medicine to create our Engineering Medicine program. Students in this program earn an M.D. degree and a Master of Engineering in engineering.
- **Interdisciplinary Engineering:** We offer a Master of Science in interdisciplinary engineering, as well as a

Doctor of Philosophy in interdisciplinary engineering. These degrees are perfect for accomplished engineering students whose research interests cross engineering disciplines and/or colleges.

- **Doctor of Engineering:** Students in this program gain a higher level of understanding of how technological advances can be implemented through industry to solve problems that affect society. ▽





TEACHING FROM EXPERIENCE

It's been 22 years since Dr. Chuck Wolf graduated from Texas A&M University with a bachelor's degree in civil engineering. Despite having a successful career in industry — which took him to Avondale, Arizona, for several years and then Los Angeles, California — Wolf did what many other Aggies have done. He came back to College Station to give back to the university that he loves.

Wolf is also passionate about educating undergraduate and graduate students about an academic path often overlooked — the Doctor of Engineering. After completing his bachelor's degree in 1998, Wolf stayed at Texas A&M and completed a master's degree, and eventually earned a Doctor of Engineering a few years later.

Unlike a Ph.D. program, the Doctor of Engineering focuses less on research and more on developing industry leaders.

"I love working with people and leading and supporting teams, but the skills pertinent to doing this in a business setting are not part of a traditional engineering degree program," he said. "When faced with office and project leadership opportunities early in my career, I knew I needed to add these skills and add them in a way that connected to the engineering profession, not just business in general. The Doctor of Engineering program was the perfect solution." ▀



COMBINED DEGREES OFFERED

- **Interdisciplinary Engineering and Law:** This program allows a student to earn a Bachelor of Science in interdisciplinary engineering and a Juris Doctor degree in just six years, shaving a full year off the normal time to completion. Studies can emphasize electrical/mechanical devices and IP/patent law; environment, health, and safety engineering and law; or other possibilities.
- **Interdisciplinary Engineering and Public Health:** This program allows a student to earn a Bachelor of Science in interdisciplinary engineering and a Master's in Public Health in just five years, one year less than the typical schedule. The program emphasizes biomedical devices and occupational aspects of public health. ▼

FEATURED FACULTY



“It takes a lot of drive and courage for a student to think outside the box and pursue her or his own academic path – recruiters like to see that. Multidisciplinary engineering students show that they can take charge of their own learning and gather a variety of important skills and areas of knowledge. Those are the qualities that lead to success in the professional world.”

Dr. Kelly Brumbelow

Associate Professor, Civil and Environmental Engineering
Director, Interdisciplinary Engineering Program Development



TEXAS A&M UNIVERSITY
Department of
Multidisciplinary Engineering

engineering.tamu.edu/mtde

DEPARTMENT OF MULTIDISCIPLINARY ENGINEERING

BY THE NUMBERS

ENROLLMENT*

(FALL 2020)

179 Total

114 Undergraduates

65 Graduates

180 Total Graduated Students

FACULTY

26 Total Faculty

14 Primary Faculty

12 Courtesy/Director
Level Faculty

40 Affiliate Faculty

**preliminary*