

MECHANICAL & ENERGY ENGINEERING

COLLEGE OF ENGINEERING
2017-2018



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**FIRST DOCTORAL
GRADUATE LANDS A
FULL PROFESSOR POSITION**



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MESSAGE FROM THE CHAIR



DR. KURUVILLA JOHN

Greetings from the University of North Texas!

This past year we celebrated the 10-year anniversary of the Department of Mechanical and Energy Engineering (MEE). It was a wonderful and a joyous evening with alumni, students, staff, faculty and friends of the department helping us to celebrate this milestone. As we embark on our second decade, the department will be building on past successes and chart a strategic course to higher achievements and accomplishments.

Over the past year we have added four new faculty colleagues who bring diverse experience in areas such as computational heat transfer, computational fluid dynamics, sensors and energy harvesting. To support the continued growth in our programs, we will be adding four more colleagues in the upcoming year.

With an enrollment of 647 undergraduates, 33 M.S. and 33 Ph.D. students during fall 2018, we are one of the fastest-growing and currently the second largest department within the College of Engineering at UNT. The diverse students in our department reflect the changing demographics of our state. We are proud to be educating the next-generation technical and thought leaders in this exciting engineering discipline.

So far to date, we have produced 860 MEE graduates who have successfully transitioned from their student days here at UNT to the real-world as highly successful professionals. MEE graduates have gone on to exciting career opportunities in industry, academia, government labs and in the non-profit sector. Several have gone on to become serial entrepreneurs, while several others are pursuing graduate degrees.

Faculty colleagues and students have been busy over the past year in helping grow our research enterprise within the department. With nearly \$1 million in research expenditures and having secured close to \$500,000 in new awards over the past year, our faculty are making strides in research. Faculty and students have published 34 papers in archival journals and presented 15 papers at national and international conferences during the past year. Faculty also have taken on leadership roles on the boards of professional societies and prestigious journals.

The MEE department is actively engaged with local area industries and businesses. Students are working with mentors in the department and from industry to solve cutting-edge problems and design creative solutions. Local industry and supporters have generously sponsored 30 capstone senior design projects for our undergraduate students this past year.

This report captures some of the highlights in MEE from 2017-2018. I am looking forward to an exciting year and to the next decade ahead of us. If you would like to learn more about our programs, please contact me.

Go MEEN Green!

Kuruvilla John
Professor and Chair



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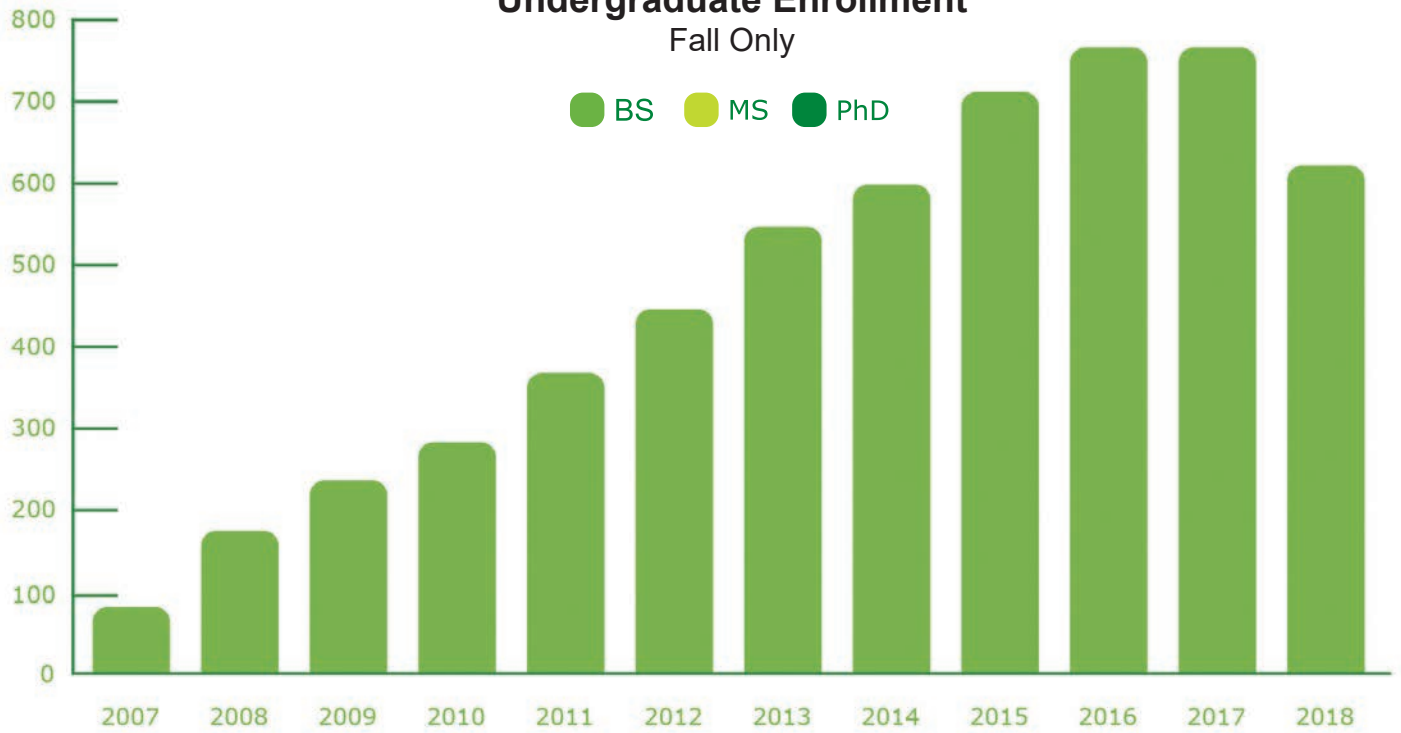


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MEE BY THE NUMBERS

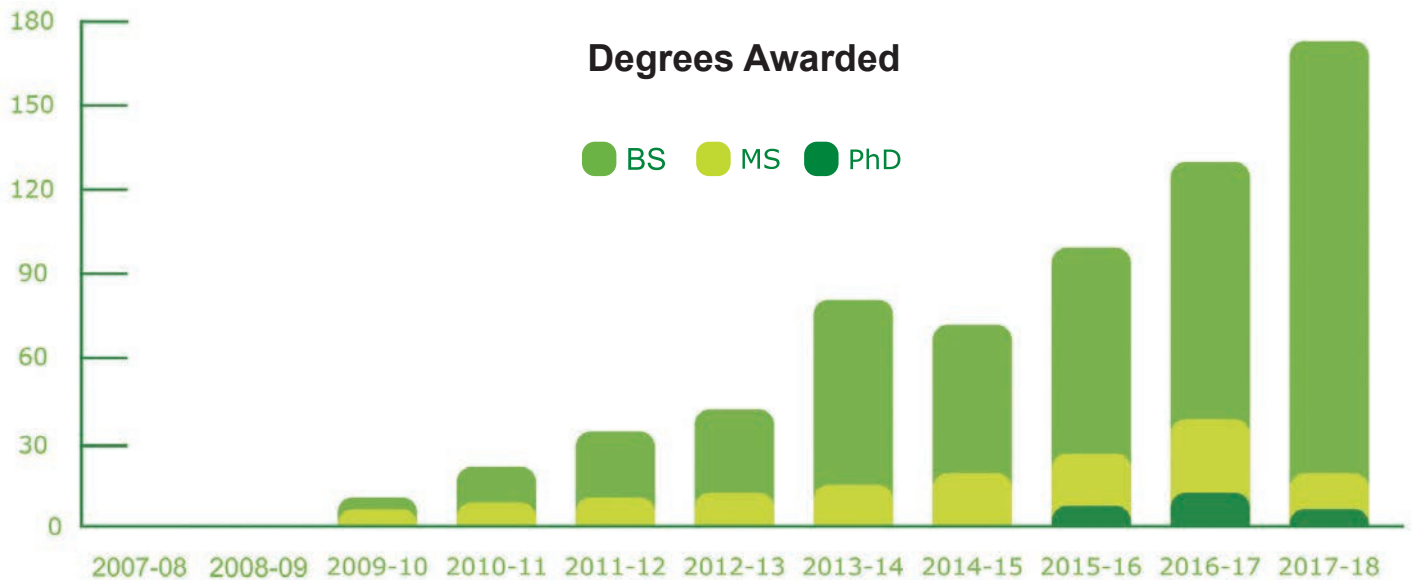
Undergraduate Enrollment Fall Only

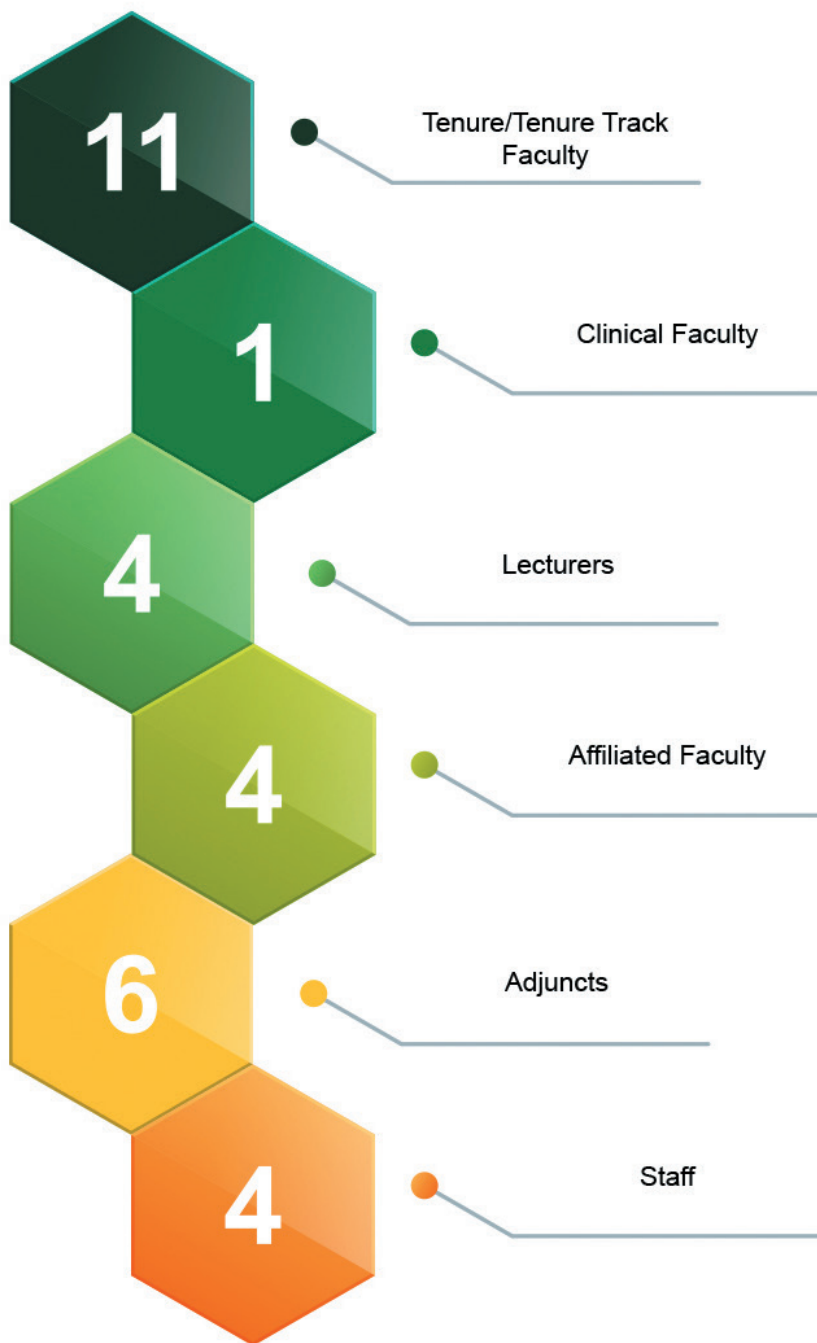
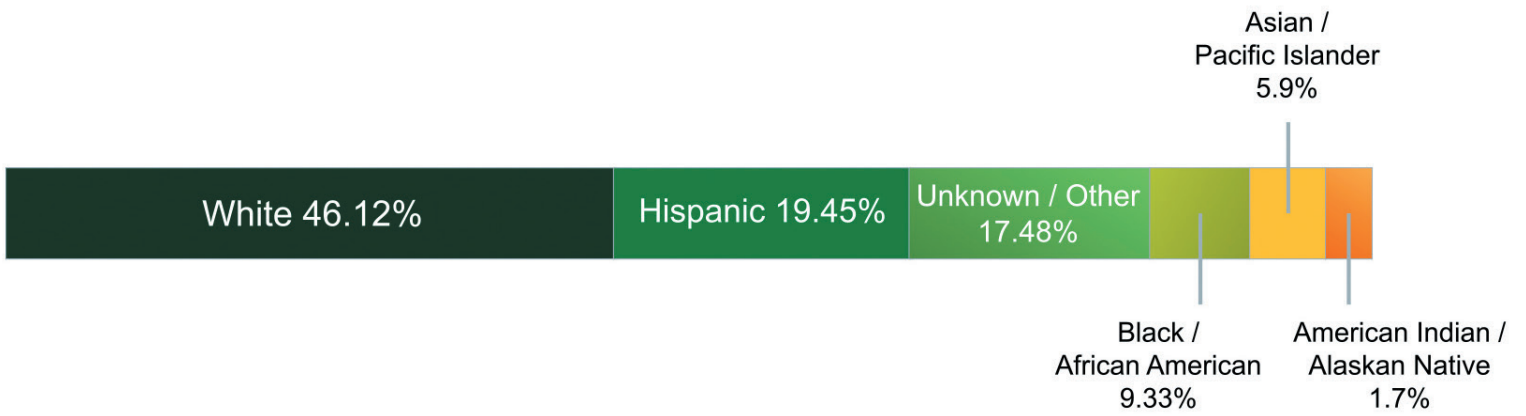


Graduate Enrollment Fall Only



Degrees Awarded





Research

\$969,954

Expenditures

\$485,545

Awards

34

Publications

Students

860

Alumni

229

First Generation Students

30

Senior Design Sponsors

DR. RUSSELL REID

 DR. RUSSELL REID



Russell Reid

 KAYLA GREEN

Russell Reid comes to UNT from the U.S. Naval Research Laboratory, where he was an American Society of Engineering Education (ASEE) Postdoctoral Fellow. He received his Ph.D. in mechanical engineering from the University of Utah in 2016. Prior, he spent nearly seven years working in industry, first for Precision Systems Engineering, a heavy industrial engineering consulting firm, and then for Wencor, an aftermarket commercial aircraft parts manufacturer.


Reid's research focuses on giving individuals greater control over their personal health care so at-risk individuals and seemingly healthy people are not caught off-guard by a serious health issue.

"I subscribe to the philosophy expressed by the electrochemist, Adam Heller, who said that the purpose of research is to uncover new truth and use it to develop technologies and processes that improve people's lives," said Reid.

Reid says he and his students hope to alleviate health care problems by combining engineering principles with electrochemical methods to develop biosensing and bioenergy materials and devices. Currently, his group is involved in making self-powered wearable biosensors and single-cell nanoelectrode probes to detect neurotransmitters. Previous research projects include a contact lens biofuel cell and a paper-based pesticide sensor.

Reid earned his master's degree in systems engineering from the University of Virginia and his bachelor's degree in mechanical engineering from Brigham Young University in Provo, Utah.

DR. HAMID SADAT

 DR. HAMID SADAT



Hamid Sadat

 KAYLA GREEN

Hamid Sadat earned his Ph.D. in Mechanical Engineering from the University of Iowa in 2009 and M.Sc. and B.Sc. degrees from Mechanical Engineering Department at Sharif University of Technology in Iran in 2004 and 2002, respectively. Sadat also completed post-doctoral studies at the University of Iowa.

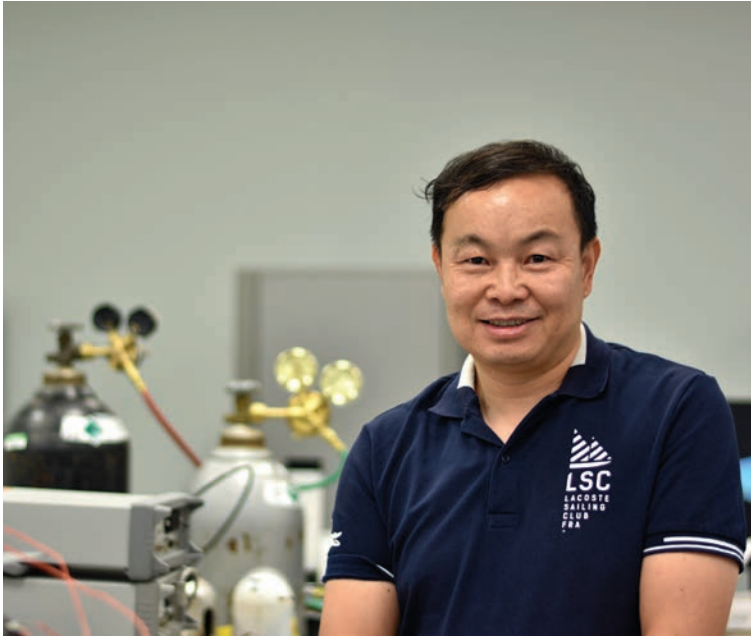
Sadat worked as a research scientist and an adjunct assistant professor at the University of Iowa Mechanical Engineering Department for seven years before joining UNT in 2018. His expertise is in computational fluid dynamics, high fidelity fluid-structure interaction modeling and simulation, multi-phase flows, multi-disciplinary physics-based computational methods, high-performance computing, verification and validation, and deterministic and stochastic simulation-based design and optimization.

Sadat is currently working on developing computational tools for studying particulate flows formed by ice pieces in the arctic regions, stratified flows and internal waves in oceans, turbulent free surface flows around ocean vehicles and offshore structures, bubbly flows due to air entrapment and cavitation, and biological flows in supported heart systems with assistant devices.

Sadat has published a book chapter and more than 50 peer-reviewed journal and conference papers from his research studies.

DR. HAIFENG ZHANG

 DR. HAIFENG ZHANG



Haifeng Zhang

 KAYLA GREEN

“Haifeng Zhang is an associate professor in UNT’s Department of Mechanical and Energy Engineering at the University of North Texas. His research interests include advanced sensors in harsh environment, energy harvester design, structural health monitoring and ultrasonic nondestructive evaluation. He has published more than 50 referred journal and conference papers and his research is funded by a variety of funding agencies, including the National Science Foundation, U.S. Department of Energy, the U.S. Army Research Office, the U.S. Department of Defense, U.S. Army Natic, the U.S. Department of Agriculture and industry.

Dr. Zhang’s group is specialized in developing advanced sensor for harsh environment applications such as pressure and temperature sensors in high temperature environment, and gas sensors for the monitoring of gas turbine engine. Recently, the group is working on a DOE funded project to transmit sensor signal through a metal wall in high temperature for nuclear spent fuel health monitoring. The through-wall transmission technique is based on ultrasonic principle and have promising application in other areas such as Surface or subsurface vessel hulls, Chemical storage tanks, and Astronautical vehicles. Dr. Zhang’s group is also working on several projects on nondestructive evaluation (NDE) sponsored by Defense agency.

Zhang received his B.S. in Engineering Mechanics from Hunan University in China, his master’s degree in solid mechanics from Northwestern Polytechnical University in Xian, China, and his Ph.D. in Engineering Mechanics from University of Nebraska, Lincoln. He was a postdoctoral researcher in the Department of Material Science and Engineering at The Ohio State University before joining UNT in 2008. Zhang also serves as a committee member on ASME’s energy harvesting technical committee.”

DR. ZIHAO (RICHARD) ZHANG

 DR. ZIHAO ZHANG



Zihao (Richard) Zhang

 KAYLA GREEN

Zihao (Richard) Zhang joined UNT as an assistant professor in fall 2017. After working as a satellite thermal engineer at Aerospace Corporation in El Segundo, Calif.

He received his doctoral and master’s degrees in mechanical engineering from Georgia Tech and his bachelor’s from MIT.

Zhang’s research interests are in nanoscale heat transfer, nanomaterials and aerospace applications. He has published in a variety of applied physics and thermal-fluids journals, including Applied Physics Letters, ACS Photonics and Journal of Heat Transfer. Zhang is currently working with one doctoral student on the radiative and thermal conductive properties of topological insulators.

This summer, Zhang will be at Kirtland Air Force Base in Albuquerque, N.M., researching the thermal properties of non-equilibrium low-dimensional bodies under ultra-fast irradiation.

“The work has implications on ultra-sensitive visible light and infrared radiation sensors, and overall, may point toward identifying novel synthetic materials with extreme anisotropy and unusual thermal conductivity,” said Zhang.

HONORS

JOHN NAMED EDITOR-IN-CHIEF OF *IJECE*

 KAYLA GREEN

Kuruville John, chair of the Department of Mechanical and Energy Engineering, recently was named editor-in-chief of the International Journal of Energy for a Clean Environment published by Begell House.



Kuruville John

 KAYLA GREEN

He, along with Kevin Crist, director and professor of chemical engineering at Ohio University and co-editor-in-chief of the journal, are revamping the journal and changing its overall direction to focus on the theme of energy for a clean environment.

“Energy production and consumption have huge footprints affecting the environment surrounding us and the planet at large,” said John. “The dominant sources of energy today are heavily dependent on fossil-based fuel systems and these have multi-media environmental impacts in the form of air, water and soil pollution, climate change and resource utilization. Development of new and innovative clean energy technology is extremely crucial for our world as we move towards a sustainable future needed for human survival.”

By redesigning the journal, John feels it will more closely reflect the field. “The focus of the journal was very narrow and it targeted a very specific sub-discipline of heat transfer within mechanical and energy systems. The area of clean energy and the environment, however, is much more interdisciplinary in nature,” said John. “We decided to revamp the focus of the journal and also bring in new faces on the editorial board from around the world with certainly much more diverse experience. We are currently recruiting top scientists from various research productive nations in Asia-Oceania, EU, Africa and the Americas to serve on this board.”

The appointment, which began in January, lasts for four years.

PRASAD NAMED TO *ASTFE* BOARD OF DIRECTORS

 KAYLA GREEN

Vish Prasad, professor of mechanical and energy engineering, was recently named to the board of directors of the American Society of Thermal and Fluids Engineers (ASTFE). ASTFE’s Board of Directors consists of eleven members who have made distinct contributions to thermal sciences and fluids engineering.

ASTFE’s Board of Directors is responsible for policies, budgets and finance, organizing conferences and workshops, partnerships with other national and international organizations. Prasad’s focus will be on fundraising and outreach.



Vish Prasad

 MICHAEL CLEMENTS

“My goal is to make ASTFE financially strong by soliciting funds from government agencies and non-profit organizations and foundations,” he said. “I will also be looking at partnerships with leading organizations in the thermal sciences and fluids engineering field both nationally and internationally.”

Separately, Prasad has also been invited by the Indian Institute of Technology, Kanpur (India) to join as an (honorary) adjunct professor of mechanical engineering where he will interact with the faculty and students of IIT Kanpur on their academic and research activities and teach courses on special topics during summer or winter breaks.

SHULL RECEIVES THE MINA PRAKASH KAPADIA SERVICE IN ENGINEERING AWARD

 CALLIE WOOTEN

Department of Mechanical and Energy Engineering lab manager, Robbin Shull, was awarded the Mina Prakash Kapadia Service in Engineering Award by the College of Engineering in 2017. The award, named in honor of Associate Dean for Undergraduate Studies Nandika D'Souza's mother, Mina Prakash, is given to staff who show exceptional service to others and exemplify a life of service characterized by support of the needs of others, organizational efficiency, clear communication, and engagement of all stakeholders, just as does D'Souza's mother.



Robbin Shull receiving award

 KAYLA GREEN

“Robbin has played a key role in providing advice and assistance to the students in mechanical and energy engineering,” said Kuruvilla John, chair of the department. “With his leadership and professionalism, he has ensured that our students receive top-tier shop training, understand safety standards and access to necessary tools. A warm and welcoming supporter of the Mechanical and Energy Engineering family, we can think of no one more deserving of an award that showcases an individual’s exceptional service to others.”

Many congrats, Robbin Shull!

D'SOUZA NAMED TO WEPAN BOARD OF DIRECTORS

 CALLIE WOOTEN

Nandika D'Souza, associate dean of undergraduate students and professor in mechanical and energy engineering, was recently named to the Women in Engineering ProActive Network (WEPAN) board of directors. WEPAN seeks to increase participating, retention and success of women and other underrepresented groups in engineering. D'Souza was appointed based on her dedication, leadership and advocacy.

“Dr. D'Souza has been an inspiring standout within her field and within the mechanical and energy engineering department,” said Kuruvilla John, chair of the department. “She’s an impactful leader within the classroom, and as the associate dean of undergraduate studies, a bright engineer of nanotechnology and polymer and composites, and a friendly force of passion, she is, without a doubt, a most deserving recipient of this position.”

Many congrats, Dr. Nandika D'Souza!



Nandika D'Souza

 UNT

ANCHORING A CONNECTION WITH MEEN AND THE NAVY

 RUSSELL REID + KURUVILLA JOHN

I spent three days and two nights at sea aboard the U.S.S. John C. Stennis aircraft carrier as part of the U.S. Naval Air Force's Distinguished Visitor Embarks to Sea Experience – a Navy outreach program, and it was truly an amazing experience that increased my appreciation for military service members and their families as well as stressed the role engineering plays in supporting defense. Along with 15 other educators from around the country, I arrived at the Naval Air Station North Island in San Diego, Calif., early on the morning of May 3. We were taken to a small air terminal on the base, given hearing protection and life vests and instructed on our flight from the base to the aircraft carrier aboard a 26-passenger C-2A Greyhound. The aircraft's interior was purely functional – no decorative paneling, and it was loud and dark. After 30-45 minutes in the air, the crew signaled that we would be landing in the next 15 seconds, which came as a surprise to most of us because there were only two windows in the entire cabin.



Russell Reid aboard the U.S.S. John C. Stennis

 RUSSELL REID

When the aircraft landed, a hook on the end of its tail caught a cable on the flight deck, abruptly stopping us within just a few seconds of landing. The sudden stop thrust us into the back of our seats (we were all facing backwards). We stepped off the plane and were ushered past the hustle and bustle of busy sailors in the middle of flight operations training exercises. We were welcomed to the ship by the second-in-command and spent the rest of the day meeting many different crewmen from the ship's captain to newly enlisted sailors. We were escorted all over the ship including to the command center, flight operations center, below-deck hangar, maintenance bay, dentist's office, sick bay and detention area, or the brig. We ate some of our meals with the officers and other meals with the enlisted personnel. Everyone I met was respectful, knew their duty and was proud of their job. When night came, we retired to our staterooms, two people to a room, and slept in bunk beds. Even though we were warned beforehand that flight operations would continue well past midnight, the thunderous sound and feel of aircraft engines reverberating through the ship's steel structure was eye-opening (literally) and made for a long first night. Thankfully, flight ops didn't extend late on the second night.

Our stay was originally meant to be just two days and one night, but as we prepared to depart on the second day, we were informed that our transport would not be coming. That was fine with me, because it meant more time to watch from the observation deck as many F/A-18 Super Hornets were taking off and landing and also more chances to eat delicious Navy food from the cafeteria (it was actually pretty darn good). The public relations crew ran out of activities for us eventually and resorted to showing us the movie "Top Gun" to occupy some of the last bit of our visit! Once the transport arrived, we boarded the aircraft, strapped in and were told to fold our arms across our chests in preparation for being catapulted off the carrier. The catapult triggered without warning and our aircraft was accelerated from 0-115 mph in 2 seconds, momentarily throwing my body forward, totally suspended by the four-point harness. What a great experience!



Kuruvilla John aboard the U.S.S. Lassen

 KURUVILLA JOHN

Dr. Kuruvilla John also represented the College of Engineering at the U.S. Navy Educator Orientation Visit (EOV). He visited Naval Air Station Jacksonville, Naval Submarine Base Kings Bay and Naval Station Mayport, located in Florida and Georgia June 26-27. John interacted with Navy personnel and other area educators from the Dallas-Fort Worth area during the EOV in June. During this, he spent time on the U.S. Naval assets, including the Trident submarine, U.S.S. Lassen, Naval Technical Training Unit, Naval Hospital and HSM-74 helicopter squadron. The visit focused on collaborative opportunities between the Department of Mechanical and Energy Engineering and the U.S. Navy.

ALL ABOUT ABET ACCREDITATION

 ERIN ALLICE

This fall, the Department of Mechanical and Energy Engineering will undergo its next review for ABET accreditation, which occurs every few years.

ABET accreditation is obtained through the Accreditation Board for Engineering and Technology (ABET) and ensures that engineering and technology programs meet certain academic and program standards. The process requires departments like MEE to undergo periodic reviews of its curriculum, processes and academic standards.

In preparation for this year's review, UNT College of Engineering Associate Dean for Undergraduate Affairs Nandika D'Souza and MEE senior lecturers Xiaohua Li and Cherish Qualls attended ABET's annual symposium in this past spring in San Diego, Calif. The week-long conference provided insight into the accreditation process, changes in evaluation criteria and suggestions on how to improve the student learning experience.



Cherish Qualls and Nandika D'Souza in San Diego, Calif.

 XIAOHUA LI

Kuruvilla John also attended the American Society of Mechanical Engineers (ASME) Mechanical Engineering Education Division (MEED) Leadership Summit in San Diego during March 14-17, 2018. At this summit, he participated in an ABET workshop for mechanical engineering department heads to learn about recent ABET changes for the upcoming accreditation visit.

THE FUTURE IS BRIGHT FOR DR. QUALLS

 ERIN ALLICE

Senior Lecturer Cherish Qualls is an integral part of UNT's Department of Mechanical and Energy Engineering. After joining the department as a full time lecturer in fall of 2011 and achieving the role of senior lecturer in fall of 2015, Qualls has helped the department grow and flourish.



Cherish Qualls

 KAYLA GREEN

Qualls's passion for engineering started early on in college.

"I always did well in math and knew I would enjoy applying those math skills to real-world applications. My sophomore-level dynamics class was taught by an aerospace engineering professor. I did really well in the course, and he convinced me to make the switch from industrial engineering to aerospace engineering," Qualls said.

After graduating with a Ph.D., Qualls accepted a position as a systems engineer at Lockheed Martin, and was an adjunct for UNT's mechanical and energy engineering department teaching the system dynamics and controls class. Qualls's experience working at Lockheed Martin and as an adjunct instructor gave her the foundation she needed to take the next step in her career.

"The opportunity to contribute to a new department and help it grow is what initially attracted me to MEE," said Qualls. "Now that I have been here for several years, I can say that the coworkers and students I work with are what make working here such a positive experience."

Qualls enjoys getting to know the students and watching them transform from freshmen into successful, employed engineers. So much so, she plans to continue educating future engineers and furthering her academic career.

HEATING UP BIOFUEL RESEARCH

 KAYLA GREEN

Professor Sheldon Shi and Associate Professor Haifeng Zhang, both from the Department of Mechanical and Energy Engineering, have received a \$482,905 grant from the United States Department of Agriculture to develop a high-temperature sensor to improve the production efficiency of biofuel from biomass.

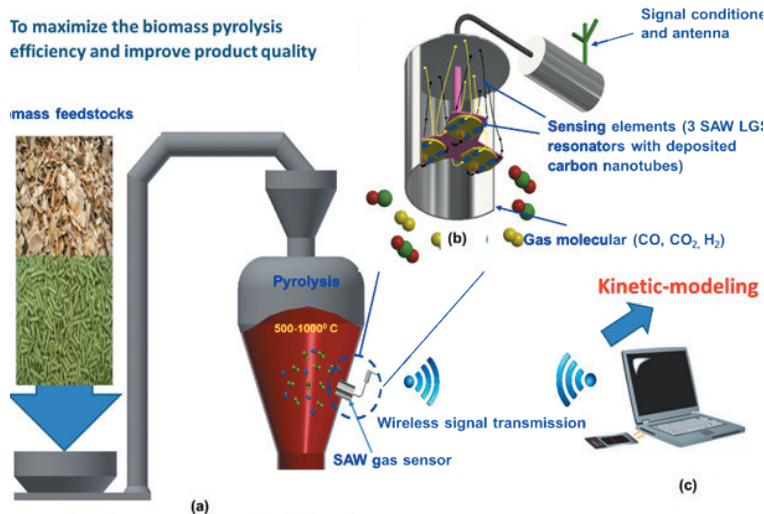
“For this project, we’re going to build a high temperature sensing system to put into the pyrolysis furnace, so it can detect the gases coming out from the biomass during the pyrolysis,” said Shi. “Right now, there’s no such system available.”

Shi says pyrolysis is when the biomass material decomposes due to high temperatures. Currently, for the pyrolysis of biomass, the material is loaded into a furnace and “cooked” for a certain period of time at a certain temperature. The determination of the temperature and time is based on experience and multiple experiments, which may not be exact each time. Shi also says that when the feedstocks changes, the “cooking” parameters may also need to be changed during the process.

“Traditionally, it’s all been done through guessing,” he said. “Now, if we have such high temperature sensing system in the furnace, we can monitor it in real time based on the gases emitted from the furnace.”

It’s a tool that could not only help researchers determine optimal parameters for the pyrolysis of the biomass, but also create a more efficient and cost-effective process by eliminating the repetitive and unnecessary testing.

“Once we have the sensing system, we’ll be able to analyze the pyrolysed materials at different processing parameters so that a process model of pyrolysis can be established through simulation,” said Shi.



Technology demonstration for real time gas monitoring with SAW gas sensing system in the pyrolysis process:(a) The biomass feedstocks feed into the high temperature gasifier; (b) the enlarged view of the SAW gas sensor and signal conditioner; (c) PC with wireless transmitter

PROFESSOR RECYCLES JEAN FABRIC FOR HOUSING CONSTRUCTION MATERIAL

 KAYLA GREEN

Oh, jeans! Sheldon Shi, a Department of Mechanical and Energy Engineering professor, has partnered with a jeans company in North Carolina to make use of wasted denim and turn it into something more useful. “We’re working with VF Jeanswear to fabricate structural panels for flooring in buildings,” said Shi. “By re-using their wasted denim fiber, we can hopefully create a new use for the material that is both practical and applicable to modern households.”

Shi says UNT is in a unique position in that it offers a 4-by-8 foot hot press capable of creating a full-size panel – a machine most universities do not have. “University of North Texas is the only university in the central south who has the 4-by-8 foot hot press,” said Shi. “I think one of the reasons they chose us was because we have the capability to fabricate full-size panels.”



Sheldon Shi preparing the jean fabric

 KAYLA GREEN

The team has been asked to create 20 panels using the wasted denim fiber collected during production. Once the panels have been fabricated, Shi and his team will deliver them to the company, who will then construct a demo house to test the realistic capability of using the panels as flooring.



Liping Cai and Xun Wang preparing the jean panel

 KAYLA GREEN

RESEARCHERS AT UNT CREATE ENVIRONMENTALLY FRIENDLY, MORE EFFICIENT REPLACEMENT FOR LITHIUM ION BATTERIES

 COURTNEY TAYLOR

University of North Texas researchers in the College of Engineering's Department of Materials Science and Engineering have created a uniform, thin, two-dimensional material that could revolutionize materials science.

Lithium-ion batteries power some of the most used electronics, including smartphones, laptops, tablets and electric cars. Researchers at the University of North Texas College of Engineering have developed a higher-power, longer-life, environmentally-friendly lithium-sulfur alternative that could replace the lithium-ion battery. Their research has been published in the Nature Nanotechnology journal.

"The lithium-ion battery has limited capacity," said Wonbong Choi, professor of materials science and engineering and mechanical and energy engineering. "For example, when you charge a cellphone, you get maybe one day of use. We need higher efficiency – maybe where one charge lasts a week. The lithium-sulfur battery has five times, or more, of the charge and discharge capacity of the lithium-ion battery and hopefully will eventually replace it."



Lithium-ion battery

 KAYLA GREEN

Choi collaborated with three of his doctoral students – Juhong Park, Mumukshu D. Patel and Eunho Cha – as well as Vish Prasad from UNT mechanical and energy engineering and two other local scientists – to create the battery. The researchers have applied for a patent through UNT and are working towards potential prototyping and production.

"If the lithium-sulfur battery is produced commercially, it will be safer and cost less than the lithium-ion, have higher power density and be environmentally friendly. It can also be manufactured at a large scale. The Li-S battery has been studied by many researchers, but no commercial products have been produced because of several critical problems. We have resolved those issues," Choi said. "We want to use lithium metal on one electrode and sulfur on the other electrode, but lithium metal is too reactive and sulfur is an insulating material."



Wonbong Choi working with graduate students

 KAYLA GREEN

We are using technology in our lab that produces a three-dimensional sulfur carbon nanotube composite material to add conductivity and a nanomaterial coating on lithium metal for a stable electrode that can be commercially produced."

In their research, they discovered that the element molybdenum, when combined with two atoms of sulfur, creates a 2-D material called MoS₂ that allows them to control the thickness of the coating, which is 10,000 times thinner than a strand of hair, and create the necessary performance of lithium metal. They also have proven that the battery's stability allows for more than 1,000 cycles with much higher energy density than lithium-ion, which is a Department of Energy requirement prior to commercial production.

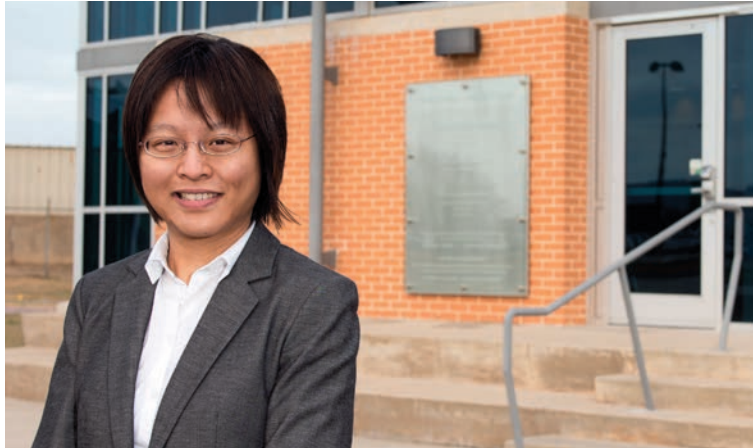
"Thanks to the discovery and research into MoS₂, this conceptual technology of building next-generation batteries can become a reality in the next five years or so," Cha said. "We demonstrated a very stable, long-lasting battery. We basically created a battery that uses an invisible coating to do major things."

The researchers say this discovery could change the future of battery-operated devices. "This will bring a major breakthrough in the lithium-based battery for next generation applications and can have a huge impact on the development of electric vehicles and high power electronics," Prasad said.

IN THE HEAT OF THINGS: A PROFESSOR'S PURSUIT OF HEAT TRANSFER AND MORE

 ERIN ALLICE

Weihuan Zhao, assistant professor in the Department of Mechanical and Energy Engineering, received her Ph.D. from Lehigh University and completed her post-doctoral research at Argonne National Laboratory before joining the department in 2015. Since starting at UNT, Zhao has expanded her research in the areas of heat transfer and thermo fluids and is working on multiple collaborative projects.



Weihuan Zhao

 UNT

Zhao received a UNT research seed grant in 2018 on a collaborative project with Vish Prasad, professor in mechanical and energy engineering, and Wongbong Choi, professor in materials science and engineering. They are investigating a graphene and carbon nanotube structure for efficient heat transfer. “The applications are for efficient heat removal for high power density electronics devices, MEMS devices, batteries and personal protection equipment (PPE), among others,” said Zhao.

In addition to her work with graphene and carbon nanotubes, Zhao also is working on another collaborative project with Sheldon Shi, professor in mechanical and energy engineering, on infiltrating phase change materials into Shi’s biodegradable insulation material so it can be used for thermal control inside the building envelope.

“This new material, which is processed from biomass, are natural, biodegradable, lightweight, low cost and environmentally benign,” said Zhao. “The infiltrated phase change material can help improve the insulation performance of the biomass material.”

Zhao also is working with Louisiana State University using an AI/VR model to understand how human context affects building design, including looking at the differences between virtual reality and real human comfort. These tests are being run at UNT’s Zero Energy Laboratory (ZOE).

Zhao and Cheng Yu, professor in the Department of Engineering Technology also will be exploring how phase changing materials could help make buildings more flexible and increase their ability to withstand natural disasters like hurricanes or earthquakes. Both research projects are occurring at UNT’s Zero Energy Lab.

TAE-YOUL CHOI RECEIVES RESEARCH GRANT GOAL: NSF EFRI

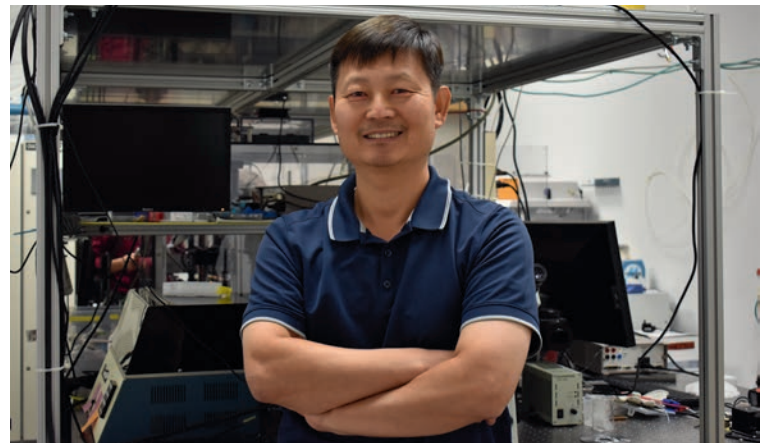
 ERIN ALLICE

Tae-Youl Choi, associate professor in the Department of Mechanical and Energy Engineering, recently received tenure for his advances in research and dedication to the department. Having joined the department in 2006, Choi was one of four founding faculty members and has watched the department and university grow into the Tier I research institution it is now. “Watching the department grow into what it is today has been a fascinating and unique experience,” said Choi. “When I was in graduate school prior to coming here, I was challenged to ‘think unthinkable,’ and it’s something I not only see the department doing but also try to incorporate into the research I do here at UNT.”

Choi, in collaboration with Arup Neogi, UNT Distinguished Research Professor in the Department of Physics and lead principal investigator, was recently awarded a \$2 million grant from the National Science Foundation to study how engineering can alter the rules and laws of physics. The team plans to combine engineering and physics to develop next-generation ultrasonic and encryption devices.

Choi’s primary research interests at the university, however, focus on heat transfer and thermal engineering, with a recent shift toward more emerging technology, including laser engineering and biotechnology. In particular, Choi is researching the mechanical properties of hydrogels and phononic crystals for phononic filters and lenses in addition to researching the thermal properties of 1, 2 and 3-D materials, including thermal conductivity. “Thermal conductivity measurements are useful in thermal management in semiconductor devices,” said Choi. “However, it may also be possible to use thermal conductivity in other applications, such as on biological cells and tissues to detect cancer.”

It’s that possibility that’s led to a new interest for Choi: investigating and eventually developing cancer detection methods through the use of thermal, mechanical and biological characterization technologies. “I am naturally interested in how things are working and what make up the working principles. I believe that one should do what he or she can do best and likes,” he said. “Engineering is something that I can do best and really like.” Choi graduated from UC Berkley’s Department of Mechanical Engineering in 2011.



Tae-Youl Choi

 KAYLA GREEN

NANDIKA D'SOUZA FURTHERS RESEARCH AT UNT IN POLYMERS, COMPOSITES

 ERIN ALLICE

UNT Regents Professor and Associate Dean of Undergraduate Studies Nandika D'Souza got her start researching polymers at the Maharashtra Institute of Technology and has expanded her research to composites after receiving her master's from Auburn University and a Ph.D. from Texas A&M University in Mechanical Engineering. Since joining UNT in 1996, D'Souza has been instrumental in expanding the college's research efforts, helping the university land its Tier One research status in 2016.

D'Souza's research in polymers and composites involves two departments at UNT: the Department of Mechanical and Energy Engineering and the Department of Materials Science and Engineering. She also collaborates with the departments of biology, teacher education, fiber arts and chemistry to solve problems in achieving multifunctional performance in fibers, foams and coatings. This allows D'Souza more opportunities for departmental crossover with her research.

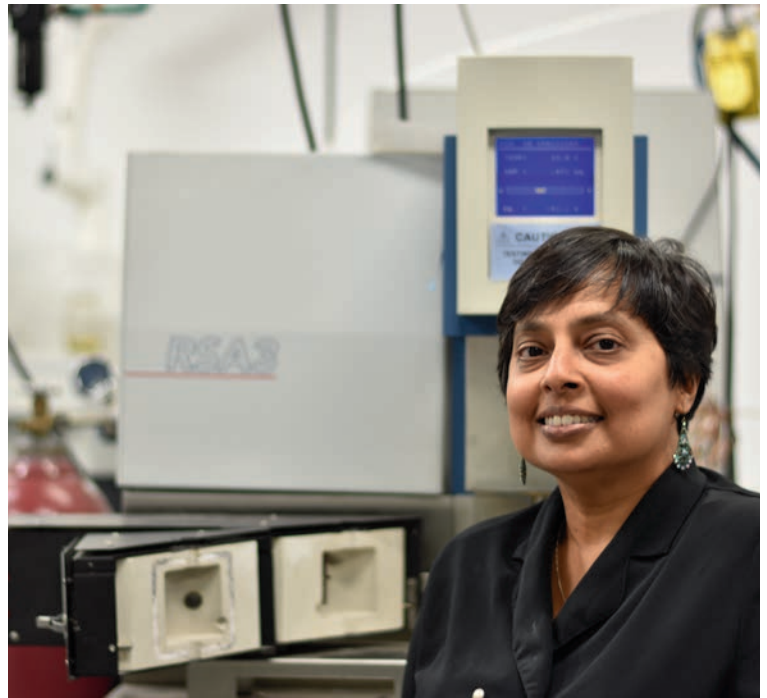
"The positive is going out of my comfort zone and working with faculty in other areas. In research, teaching and service, I like learning and growing and enabling others to see ability in themselves," said D'Souza.

Her dynamic and versatile research is funded from several grants, two of which are from NSF, one for high performance fibers and another for zero carbon footprint/energy-saving sandwich panels for the Zero Energy Laboratory. Both grants support her research on polymer fibers and their many uses.



Nandika D'Souza

 UNT



Nandika D'Souza

 KAYLA GREEN

"For both grants, at this time, we want to tune performance to dial up a combination of contradictory expectation and achieve multifunctional performance. I've always thought having one's cake should mean being able to eat it, too," said D'Souza. "One of the most exhilarating current outcomes of our laboratory is in our success with bioinspired design. Clearly, nature handles a lot. We would not have got to that point without our extensive engagement with faculty in biological sciences. Our engineered bioinspired coatings are showing unfathomable benefits in the area of corrosion and our fibers are giving dual strength and toughness."

D'Souza's vision is to further expand her research at UNT and enable students to see the potential in themselves.

"I am hoping to seek a sabbatical to execute our sensor textiles and ballistic materials," she said. "I anticipate a lifetime of research and see a purpose in facilitating the success of others."

CAPSTONE SENIOR DESIGN



Team Triumph GSD
Sponsor: Triumph

Morgan Blankenship, Aubri Frost, Zane Jackson,
Benjamin Karten, Alexander Hayden Winborn

“Denton is home. It’s not too big; its just the right balance of young adults in an established community. It’s a well-kept secret. Big town with a small town feel; big university with a small University feel.”

- Mr. Winborn



Team MultiCam 1
Sponsor: MultiCam

Jonathan Shockey, Gabriel McAdams,
Emily Smith, Ryan McCarthy, Jessie Ross



Team Brewer Science
Sponsor: Brewer Science

Andy Chao, Loek Hartjes, Hayden Hendrix,
Matthew Garcia-Thompson, Alex Powell

Team UNT Solarity

Jesse Bailey, Viviana F Guerrero, Conor Patrick Lambe,
Aaron McEwen, Cathleen Trevino



I wanted to do something where I get more of a learning opportunity. I didn't know much about automobiles, so I thought this project would be a good fit.

- Ms. Farooq



Team SAE Chassis and Suspension
Sponsor: Mean Green Racing, American Waterjet
Christopher Boucher, Mumtaz Farooq, Ryan Knight, Reece Loughmiller, Aaron Partida

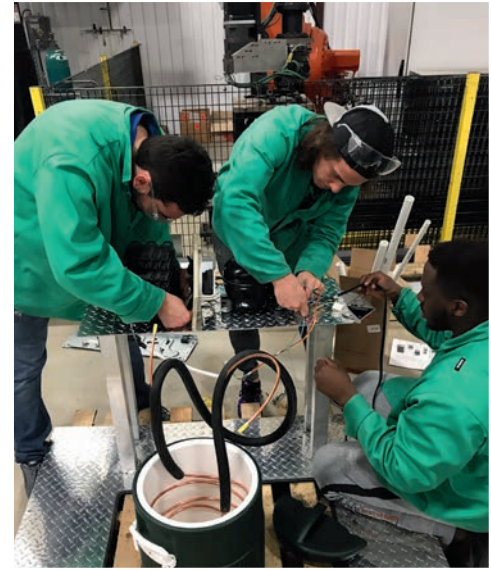
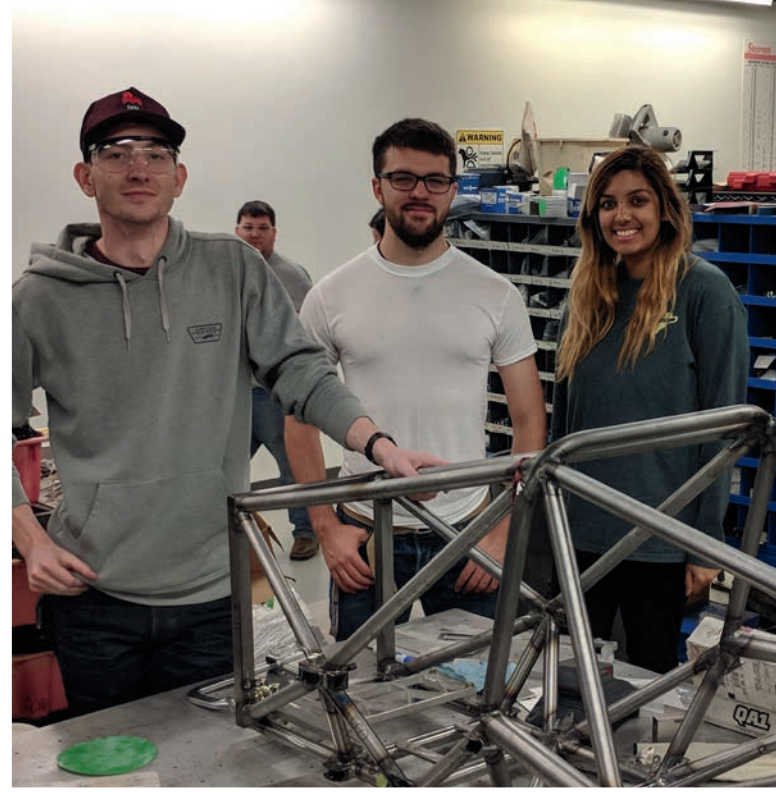


"Our project is unlike any others in that we have 5 separate parts to design and build within different timelines. Our objective is to save time so each person is getting to design by having each person design a part and then collaborating on combining all the parts together."

- Mr. Hendrix



Team Trebuchet
Michael Adams, David Ebert, Madison Hofmann-Molovich, Matt Reinhard



Thank You to

- American Wetjet
- ASME
- Avenger Racing
- Be-Wind
- Brewer Science
- BS Solidworks
- Composites One
- C&S Propeller
- Dallas Area Rocket Society
- E3 Energy



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CALLIE WOOTEN

Hearing about the Grad Track program is one thing—but it may just sound like an undergraduate degree with a few advanced classes thrown into the mix. When considering taking the plunge, prospective students should learn a bit more about their options and the opportunities that come with it.

Two Grad Track students, Daniel Whitaker and Kirk Plum, have plenty to share about their work and experience within the program, including their goals, research, influences and what they have taken away from immersing themselves in the program.

“The more you learn, you realize, the less you actually know,” Whitaker said when asked about his educational goals and the impact Grad Track had on them. “But after taking those classes, I just saw the benefits.”

The optional elective courses a Grad Track student can take open up knowledge and specifics within the engineering field that might not have been considered originally. For instances, 2018 Fall Semester offers Advanced Mathematical Methods and the weekly seminar where guest speakers share experiences and research.



Daniel Whitaker

ERIN ALLICE

“Grad Track got me to meet the graduate professors, so it put me in a comfortable zone,” said Whitaker.

“The Grad Track program has helped me gain a deeper understanding of energy issues around the world,” said Plum. “It pushed my learning to new levels while completing my degree.”

Both agree that the work is demanding but the personable relationships and connections formed are outstanding.

“The Grad Track program enables students to get a personalized education while getting more out of the classes due to the discussion that is possible because of small class sizes,” said Plum.



Kirk Plum

PHOTO PROVIDED BY KIRK PLUM

Whitaker and Plum have bright futures ahead of them through the Grad Track program. Whitaker is presently working with Rajiv Mishra, UNT Department of Materials Science and Engineering professor, on a project with the U.S. Army Research Laboratory aimed at improving ballistics armor for the military.

Plum will graduate in December 2018 with a Master’s in Mechanical and Energy Engineering. He has plans to work at the engineering firm, Baird, Hampton, and Brown in Fort Worth, Texas, where he will design HVAC and plumbing systems for buildings.

GRAD TRACK: THE ACCELERATED DEGREE PROGRAM

The program is something that means a lot to Whitaker and Plum and something they feel is worthwhile for every student to consider as they make the progression to their degree. “The Grad Track program enables undergraduates to get the most out of their undergraduate degree while obtaining a master’s degree at a greatly reduced cost,” Plum said. “I would encourage future Grad Track students to take advantage of their opportunity at an accelerated master’s degree by truly engaging in the classes and participating in meaningful in-class discussions about important global issues.”

“I would recommend having a mentor or just someone who has been through it before,” said Whitaker. “Grad Track has been a positive experience for me, and it can play a vital role in your search for future jobs. I feel more confident heading into job interviews, because of all I’ve learned and handled during my program. I think it’s a great thing about Grad Track.”



CONTACT US

Contact Callie Wooten for more information

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Ph: 940-565-2400 or Ph: 940-369-8482



WEBSITE

Find more information on our website at:

<https://mechanicalandenergy.engineering.unt.edu/grad-track>



SPEAK WITH AN ADVISOR

Grad Track Advisor: Dr. Russell Reid

Russell.Reid@unt.edu

Ph: 940-565-2400 or Ph: 940-369-944

The option to continue their education is something many undergraduates consider during their academic life. They have two selections before them and neither of them may be the obvious right one. Do they risk a delay in finding a career, so they have more education under their belt? Or should they hold off on doing more academically so they can survive financially? These are not easy questions to answer and the risk comes down to knowing and understanding their options and what exactly they can do with them.

The Department of Mechanical and Energy Engineering offers a program that introduces the pursuit of graduate level courses during a student’s undergraduate pathway. Grad Track offers a way for students to advance their education, whether their goal is to work in industry or stay in academia. When students become juniors with 75-plus credit hours behind them and a strong GPA of 3.5 or greater, they can apply to GradTrack where they will take up to nine graduate level credit hours of their choosing (with help and advice from faculty) that will count for both their undergraduate and, possibly future, graduate degree.

Opportunities stand out even if the student decides not to take the step into grad school as they have received a Tier I education from highly-regarded faculty and are well-prepared for industry. Regardless of the decision a student makes, Grad Track offers them the best of both worlds and provides another option for them to consider.

Interested in learning more about this program and its opportunities? Contact the MEE office at 940-565-2400 and begin another journey in your academic life.

 SHELDON SHI



Group photo outside Huber Engineered Woods Facility

 SHELDON SHI

On November 16, a group of MEE students had a field trip to Broken Bow, OK to visit the Huber Engineered Woods, LLC OSB facility. The field trip is part of the Bioproducts Manufacturing course offered to the senior undergraduate and graduate students. The students met with the plant personnel including the plant manager, technical director, staff from Human resources, and those in charge of the safety. Tim Romans, Plant Manager, gave an overall introduction of the Huber Company, and their OSB production. Tim, Benny, Josh, and Bob help to tour the OSB production line to the students (see pictures).

Huber Engineering Woods, LLC was founded by L.M. Huber in the year 1883. The OSB facility at Broken Bow has a state-of-the-art continuous OSB process that producing an average of 65 truckloads of OSB. It is one of the largest wood products manufacturing company in the world.



Tim, Benny, Josh and Bob help to tour the OSB production line

 SHELDON SHI

STUDENTS TRIUMPH IN SENIOR DESIGN

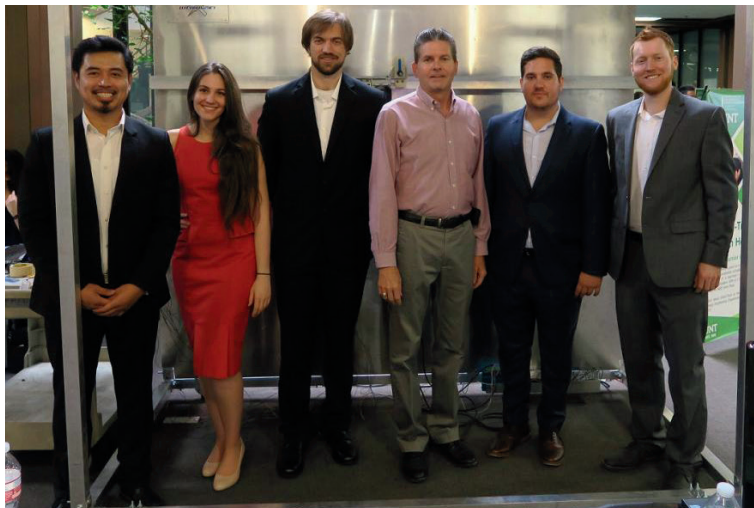
 KAYLA GREEN

Students who learn to apply theoretical concepts to practical applications are more likely to succeed in the real world than those who don't gain the hands-on experience. That's why in the College of Engineering all undergraduate seniors are required to complete a senior design capstone, known as The Engineer's Aerie.

The capstone program teaches students about project planning, budgeting, scheduling, analysis, design, fabrication and testing. It also enables students to develop their communication skills through a visual and oral presentation before an audience of peers, faculty, and experts in industry at Design Day, held on the last Friday of April each year.

Last year, 80 percent of the senior design projects in the Department of Mechanical and Energy Engineering were sponsored by industry. This year, 100 percent of capstone projects were sponsored.

"As their capstone experience, our students yearn for real life projects to apply what they have learned. They spend so much time together their senior year in teams designing and building their own ideas. Many develop lifelong friends. Nothing teaches engineering like a customer with a real project need, and nothing provides a better education than matching students with projects they are passionate about," said Mark Wasikowski, mechanical and energy engineering clinical associate professor, senior design coordinator and undergraduate advisor. "Personally, it has been a joy to help the students and watch them mature in their engineering career."



Team TRIUMPH with sponsor Don Surratt

 ERIN ALLICE

Within his department, Wasikowski says the department is able to provide opportunities for students in a variety of mechanical engineering fields, ranging from machine design, robotics and combustion science to manufacturing automation, HVAC, energy sustainability, aerospace and transportation. The students also get to work with organizations like Lockheed Martin, ASME, GE Transportation NASA and CCC Power, among others.

One group of students – Sarah Bundy, Brandon Leney, Ryne Spears, Preston Stalter, Blake Stewart and Phai Thach – selected a project sponsored by the Triumph Group. For the project, the students were asked to explore ways to improve their drilling and riveting process.

"One of the best options found was an automated drilling system run on a track that could be temporarily fixed on the panels, so we decided to verify the viability of this option by creating our own simplified version of this robotic drilling system and track," said Bundy, who focused on the project's mechanical design.

Stewart, who created the code that tells the robot how to operate, said it was programmed to drill a set pattern of holes on a loop to demonstrate the robot's repeatability. A program also was written to etch letters into the metal so as to showcase the robot's accuracy.

In addition to the practical experience gained from working on the project itself, students also are given the chance to network with industry engineers and, for some, are exposed to additional company tours and other opportunities the sponsoring organization offers. "Working with Triumph was amazing; our sponsor Don Surratt was incredibly helpful," said Stewart. "Don always made himself available to us for multiple hours every week. He also set up numerous factory tours to help the team better understand the project requirements."

Bundy agrees. "Being on a sponsored project is excellent," she said. "I highly recommend to any students choosing a project to go for the sponsored ones. There's a lot to be learned from people who have been working industry for a long time." But the benefits aren't one-sided. In fact, in today's economy, companies are struggling with an aging workforce and are short-staffed in key technical areas, making it difficult for them to solve new and challenging engineering problems.

For Triumph and other sponsoring organizations, The Engineer's Aerie helps the company find a solution to one of their long-standing projects by allowing students to tackle it under faculty and industry mentorship, freeing up company resources to focus on other strategic, high-value projects. The capstone process also provides sponsoring organizations an opportunity to evaluate and recruit students as openings arise.

"Working with the students was great," said Don Surratt, Triumph Group. "They had tremendous enthusiasm and excitement toward the project and it provided me an opportunity to mentor them on aircraft hole drilling processes and methods. They each had an opportunity to actually drill test plates and install rivets in our training classroom. As a 1987 UNT alumnus, it also provided me an opportunity to give back to the college and maybe spark some student interest in the career of aerospace and manufacturing with Triumph."

To learn more about sponsoring a capstone project, contact Thomas Derryberry, assistant dean for corporate relations, at tom.derryberry@unt.edu.

JACQUELINE GALLOWAY'S JOURNEY TO SUCCESS

 ERIN ALLICE

Commitment and dedication are familiar to Jacqueline Galloway who has been achieving her goals since a young age. Growing up Taekwondo was a whole family event that both of her parents and brother were involved in and she was eager to start. “They made me wait until I was seven so that way I could say this is something I really want to do, and then at that point, they just wanted me to commit to seeing it through to at least black belt,” said Galloway.

With her dad coaching and her brother as her training partner, she was 14 years old when she made her first national team and 16 when she made the first US National Team, the first steps in being able to compete in the World Championships or the Olympics. “We trained at the Olympic center in Mexico City, and it was so funny, I was a freshman in high school still, and they said you have to come move to Mexico City, and then you’re going to China for a month and then to Korea for another two weeks,” said Galloway “I was like, ‘I have freshman finals; I’m in high school,’ but that was the start of my high-level career competing in Taekwondo.”

Galloway’s unique approach to how she views Taekwondo led her to another passion: engineering. “I’ve viewed it as a game of chess; it’s very strategic, especially for the weight division that I am in, which is the heavy weight, but I’m not particularly tall for the international competition. So, I have to be really strategic with how I approach each different competitor, because they have such different body types. That has also fed into why I love mechanical engineering; it’s a physical problem that you’re looking at, and you have to solve with abstract ideas. That is the same way I view Taekwondo.”



Jacqueline Galloway

 SIMON BRUTY, SPORTS ILLUSTRATED

Galloway says it was natural for her to take the next step after graduating high school to attend the college of engineering to achieve her academic goals. Galloway was accepted to UNT’s Department of Mechanical and Energy Engineering degree program and is currently a senior. “It has been great, because I can still train here and my coach – my dad – lives here locally in Flower Mound. It has been the most convenient all around. It meets all the criteria for the degree I wanted as well as still be accommodating to my training schedule.” While studying mechanical and energy engineering at UNT, she was able to achieve one of her goals in Taekwondo of competing in the Rio 2016 Olympics and winning a bronze medal in the Women’s Heavyweight Taekwondo 67+kg Division.



Jacqueline Galloway

 ERIN ALLICE

“It was such a surreal feeling, because, for me, the medal itself was just an accumulation of every kick I have thrown and every injury. I had to have surgery on my hand; I’ve broken it twice, but leading up to Rio, it was just an accumulation of every single decision I have made and everyone else that has helped me along the way,” said Galloway. “It was just representative of all that emotion into one moment; it was just so emotional.”

Galloway is not stopping here, even her current injury of a torn Achilles tendon is not keeping her from reaching her next big goals: competing in next year’s World Championships and the Pan Am Games and the Tokyo 2020 Olympics, as well as graduating UNT with her Mechanical and Energy Engineering degree. “This is where I grew up. Texas, the DFW area, Denton – this is my home. So, when I am representing USA, I have that in the back of my mind that I am representing my home, my school, and my family, so it really is a direct connection for me,” said Galloway. “Just the fact I grew up here and this is my home – that’s what makes me bleed green.”

STUDENT ORGANIZATIONS ADD TO THE OVERALL STUDENT EXPERIENCE



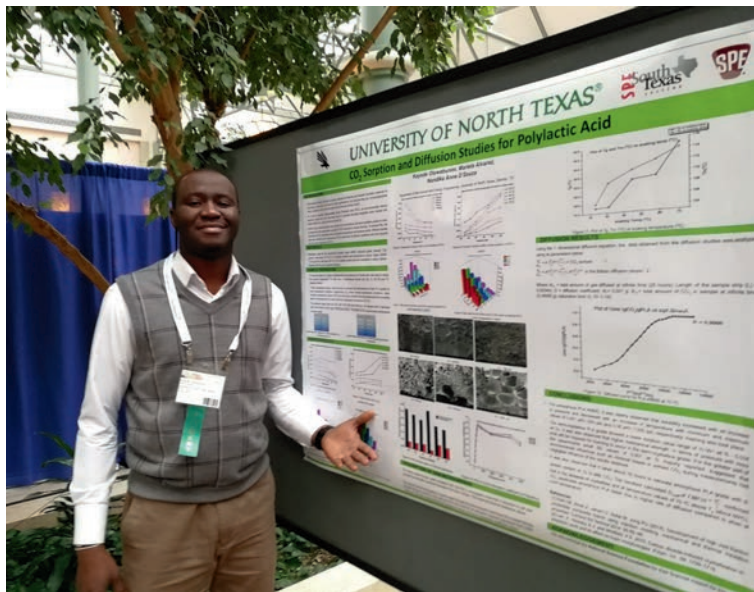
Clubs, organizations and societies open up many possibilities for students who wish to spread their academic pursuits, explore ideas and connect with people about similar passions and interests. Department of Mechanical and Energy Engineering students are provided a one-of-a-kind experience at the University of North Texas with its faculty, research and classes, but there also are plenty of other opportunities for students to explore. With more than 18 student organizations and societies available at UNT's Discovery Park, students are given a wide variety of options to choose from, including the Society of Plastic Engineers (SPE), Association of Energy Engineers (AEE) and the Society of Women Engineers (SWE).

Society of Plastic Engineers

"Joining the Society of Plastic Engineers will open up the world of plastics to an MEE student in a way which they never knew existed," said Kayode Oluwabunmi, MEE Ph.D. student and Society of Plastic Engineers member. "MEE students will better understand the different types of plastics that exist and their varying mechanical applications."

Oluwabunmi says the organization is not simply the study of plastics as most know of today. The organization provides an introduction to the industry and its evolution, aids in learning how to use plastics within the mechanical and energy field, and provides connections with professionals. The use of plastic applications can be found in different fields such as medicine, aerospace, electronics and others.

"The society creates an avenue to share ideas and build tangible networks that will be instrumental to a member's growth and development as a potential leader of tomorrow," said Oluwabunmi.



Kayode Oluwabunmi



Society of Women Engineers

"The Society of Women Engineers is a professional society a part of a national association that promotes women in STEM fields and careers," said Audrey Huneycutt, SWE vice president of the networking chair. "The organization's mission is to stimulate women to achieve full potential in careers as engineers and leaders, expand the image of the engineering profession as a positive force in improving the quality of life, and demonstrate the value of diversity."

It is a positive experience for any student, including those in the mechanical and energy engineering program, that holds a focus on creating a feeling of connection and support for those in the engineering field. It is a positive experience to not only learn more about a specific study, but to make connections and open possibilities for a student's future.

"I believe that any professional organization, such as the Society of Women Engineers is very beneficial for all students to have an assist in helping guide them in their desired career, such as attending conferences, career fairs and professional development workshops," she said.

Association of Energy Engineers

"The Association of Energy Engineers is centered on connecting students with real-world experience in the field of alternative energy, energy management and mechanical engineering," said Sheldon Aminzadeh, an AEE member. "I got interested in being part of the organization primarily due to its direct involvement in sharing and exposing information related to alternative energy."

Aminzadeh, excited to share about the organization, finds it perfectly aligned with his academic goals in that it helps him broaden his knowledge across all engineering disciplines. He says touring of the Zero Energy Lab, networking with different professionals and conducting energy audits all added to the great experience shared at the association.

"It is one thing to retain intellectual knowledge of the engineering fundamentals, but to hear the experience that the group and guest speakers share allows for more application of such knowledge," He said.

For more information about student organizations, visit engineering.unt.edu/students/organizations.

MEEN GREEN ALUMNI

Be sure to check out our new Where Are They Now section for updates on all our MEE alumni at: mee.unt.edu.

If you would like to participate send an email to erin.allice@unt.edu

With the energy electives offered by the MEE Department at UNT, I took classes that directly related to my future career at Schneider Electric that were interesting, informative, and set me up for success in understanding energy efficiency in buildings and the Energy Performance Contracting market I work in today.

- Mengwasser



Madden Mengwasser
Bachelor of Science 2016
Energy Engineer
Schneider Electric, Carrollton, Texas



AMM G. Hasib
Master of Science 2013
Manufacturing Design Surface Finishing Intern
Apple Inc., Cupertino, California



Naimee Hasib
Master of Science 2013
Received Second Masters of Science Degree from ASU
Chemical Engineering Program
Starting Ph.D. in spring 2019 Arizona State University
Tempe, Arizona



Mahdi Ahmadi
Master of Science 2016
Environmental and Energy Analyst
NESCAUM, Boston, Massachusetts



Guangyuan (Robert) Xiong
Master of Science 2013
President of JMP Petroleum Technologies Inc
President and co-founder of Worldlink Supply Inc.
President and co-founder of Tekjoy Electronics LLC
Humble, Texas



Armstrong A. Ekpete
Bachelor of Science 2016
Aerospace Engineer
Defense Contract Management Agency
(Department of Defense)
Dallas/Fort Worth, Texas

“The support of non traditional students and personal relationships with professors is world class at UNT and the MEE degree was critical to my transition from serving in the Air Force to securing an aerospace engineering role within the Department of Defense.”

- Ekpete

THE UNSTOPPABLE LINDSEY SMITH



UNT College of Engineering alumna Lindsey Smith knows how to set a goal and attain it. A self-defined overachiever, she graduated high school at only 17, and decided to pursue two degrees – one in mechanical and energy engineering at UNT and another in mathematics at Texas Woman’s University (TWU) through the dual-degree program. “I am hands down into anything I can do, touch or be involved in, so mechanical engineering was a perfect fit for me,” said Smith, who graduated from UNT’s Department of Mechanical and Energy Engineering in May 2017.

The program, which is the only one of its kind, was good for her in that it both challenged her academically and helped her branch out of her comfort zone. “That’s the thing about this campus: it’s very welcoming, and we have faculty who are approachable,” said Smith. “I felt like I could really ask the professors questions about any subject we were studying and get real life applications to relate it back to.”

In addition to her studies, Smith also led a rather active social calendar. From the American Society of Mechanical Engineers (ASME) to the Society of Women Engineers (SWE), Smith was always on the go, looking for new ways to make an impact on the field in addition to furthering her career goals. She even found time for archery, which is now a hobby at this time for her. She went on to compete in the World Field Archery Competition for Team USA and placed 10th during 2014 as a sophomore in college. “I’m always working towards a goal, whether it’s something that will help me personally, academically, or professionally, I want it to be something that really matters to make me into a diverse person,” she said.

And it’s that same practicality that led this engineer to re-think the traditional senior design project – a graduation requirement for all UNT College of Engineering undergraduates. “I wanted to do something different, and I thought it’d be really neat to build a rocket, because it was something I’d never done,” she said. “I didn’t want to just do something normal; I wanted to go big or go home.”

Smith, along with three other students, banded together and entered into the NASA’s Student Launch rocket competition in April 2017. The competition brought schools across from across the nation, who each designed and built their own rocket, to the Marshall Space Flight Center in Huntsville, Alabama. “It was such an educational packed experience,” said Smith. “We learned most of the fundamentals from our classes, and then we were given the opportunity to put that into action by creating a rocket and then launching it at the Marshall Space Flight Center.”

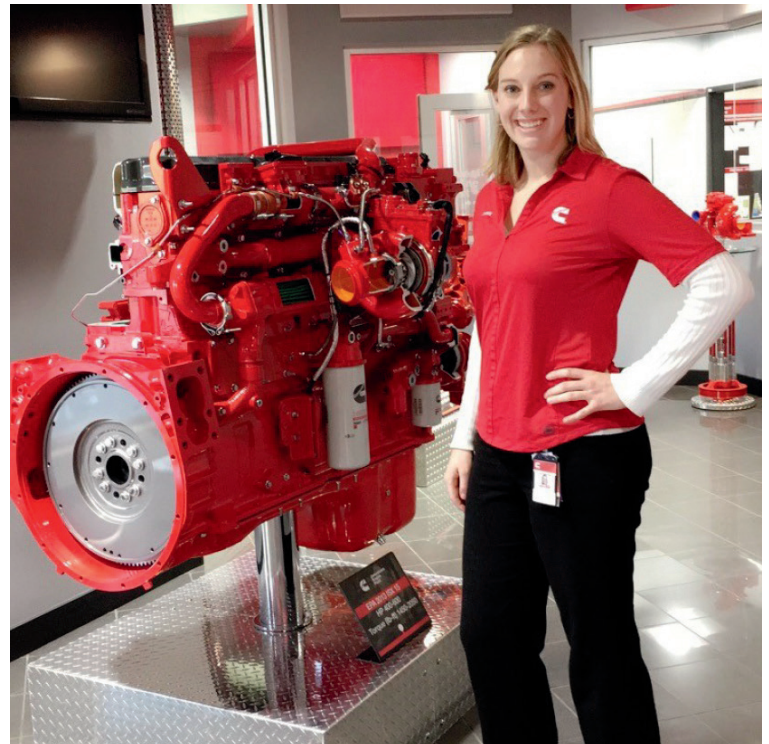
It was this experience, coupled with Smith’s three internships at GE Transportation, Bell Helicopter, and Lennox International, that she says were eye-opening experiences that taught her more about herself.

At GE, Smith worked as a supply chain manufacturing engineering intern where she worked with production kitting. At Bell Helicopter, she interned in the Engineering Technology and Innovation department where she worked on tail rotor blade sensors for autonomous vehicles in the Air Vehicle Design Department.

And, at Lennox International, Smith developed her project management skills in addition to completing her Six Sigma Green Belt in technical support.

“Through each of my internships, I really gained an understanding of what I liked and didn’t like and what I’d want to do as an engineer,” she said. “I was able to test the waters in each of my internships and gain practical experience that would increase my chances of getting a job after I graduated.”

Now, in a rotational leadership role as a manufacturing development program engineer at Cummins Inc., Smith is tackling her career with the same tenacity she had during college.



Lindsey Smith



“I love my current position, because it allows me to learn about the company as a whole and not become too specific in a certain engineering function just yet,” said Smith. “Most of my time is spent working on projects for different business units that vary from turbos, distribution centers and engine build centers to power generators or filtration systems. In addition to this, I am able to tour all of the U.S. locations and receive intensive training.”

And she’s even thinking joining the National Guard. “It’s my dream to serve my country, and this is a way that I can do so without affecting my job as a manufacturing engineer,” she said. Smith plans to pursue her Master’s in Business Administration after she completes her Leadership Development Program and rotates into another full-time position at Cummins Inc.

ALUMNUS TACKLES FOOTBALL AND ACADEMICS

 KAYLA GREEN

Chris Miles isn't your average engineer, nor is he your average football player, either. Raised in a well-educated family, there was no doubt Miles would head to college. "Growing up, there were standards we all had to meet – college wasn't optional," he said. So, when it came time for Miles to look into colleges, it was no surprise he would pick one that would allow him to combine his educational goals with his favorite sport – football. "I felt like I was just at home – the family atmosphere and the football aspect," he said. "UNT was one of the only schools that could show me someone who played football and did engineering."



Chris Miles

 PHOTO PROVIDED BY CHRIS MILES

Academically, Miles had participated in a variety of student organizations, but it was his senior design project for the Department of Mechanical and Energy Engineering that had really challenged him. "Up until then, it had been mostly theory. With senior design, we had to actually make something," he said.

Pursuing an engineering degree while playing football for UNT Mean Green wasn't easy, he says. Miles's typical day included workouts, back-to-back class, pre-practice and tape review, practice, mandatory team dinner and class or study hall afterwards. It was a routine that helped him and his team beat Southern Miss last season – a game Miles, number 67, is truly proud of – and helped land the team a spot at the Heart of Dallas Bowl.

"Southern Miss was probably my favorite game to play in; it was a monster game," he recalled. "It was our fifth win, which helped us get into our bowl game. That was a pretty big deal. And, afterwards, I received an Honorable Mention for offensive lineman." Both experiences, he said, are what make him bleed UNT green. "The work I feel like I've put in here – I'm proud of it," said Miles. "With football, I've bled, I've sweat, I've cried. Academically, I feel like I've been pushed pretty hard. I'm proud of it; this is my college experience."

The alumnus, who graduated in May 2017, is now tackling his MBA at UNT and plans to finish out his two years of eligibility with Mean Green Football.

ALUMNUS CHARGED WITH DESIGNING BATTERY PACKS

 ERIN ALLICE

Shunli Zhao, who received his M.S. in Mechanical and Energy Engineering in December 2013, is currently working at Panasonic North America - Rechargeable Battery Group as a mechanical engineer who designs lithium ion battery (Li-Ion) battery packs for industrial demands, such as power tools, medical devices and electronic devices like cameras and speakers.

Zhao was originally drawn to UNT for its IELI program, but said the Denton community and UNT mean green family were ultimately what made him choose to stay and pursue a master's degree.

"I took the English program IELI at UNT prior to my master degree, and I love Denton and UNT campus. So, I decided to finish my master's study at UNT." Zhao's next stop was the Department of Mechanical and Energy Engineering.

Zhao's research for his master's degree led him to work with Nandika D'Souza, associate dean of undergraduate studies and professor in mechanical and energy engineering, and her team.

"My research uses TSDC (Thermally Stimulated Depolarization Current) technology to detect a polymer's dielectric and insulation performance under high voltage and temperature. It was funded by Texas Instruments," Zhao said.



Shunli Zhao

 SHUNLI ZHAO

"Dr. Nandika D'Souza definitely is the person who gave me the most support. She opened the gate of polymer science, guided and led my research. Her preciseness and seriousness on research benefited me a lot, for both working and personal lives."

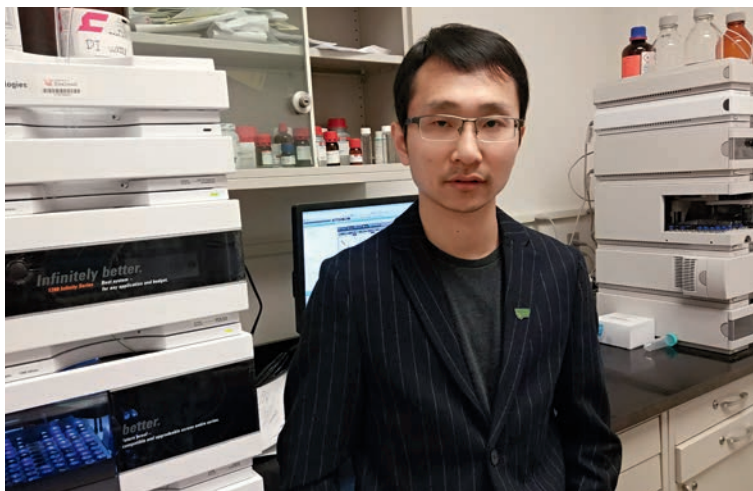
FIRST DOCTORAL GRADUATE LANDS A FULL PROFESSOR POSITION

 ERIN ALLICE

UNT's Department of Mechanical and Energy Engineering Ph.D. graduate Changlei Xia was the first doctoral graduate in the department. While currently working as a postdoctoral fellow in the Department of Chemical and Environmental Engineering at the University of Cincinnati, Xia plans to start a new career this fall as a full professor for the College of Materials Science and Engineering at Nanjing Forestry University in China. It's an exciting new career move he credits his degree from UNT as helping him achieve.

"It is a basic requirement in order to seek a higher education job, for instance, college faculty to have a Ph.D.," said Xia. "I also have a remarkable publication record (more than 20) during my Ph.D. study, which is the most important factor for me in seeking a high level academic job. I sincerely thank my advisor Dr. Sheldon Q. Shi, and Dr. Liping Cai." But Xia's achievements didn't stop at just a Ph.D. "I received the 2016 Forest Products Society 1st Place Wood Award, which honors the most outstanding research conducted by graduate students in the field of wood and wood products."

In addition to his award Xia was honored as an outstanding doctoral student, which was given to only nine students at UNT in the 2015-2016 academic year "I studied and worked at Discovery Park for four years," he said. "The industrial designed construction is unique compared with other universities. It is very easy to meet people and make friends, and I did." Xia says these accomplishments were made with hard work and dedication. "I learned how to do research at UNT, and with this foundation, I have learned how to write research funding applications and how to guide graduate students," he said.



Changlei Xia

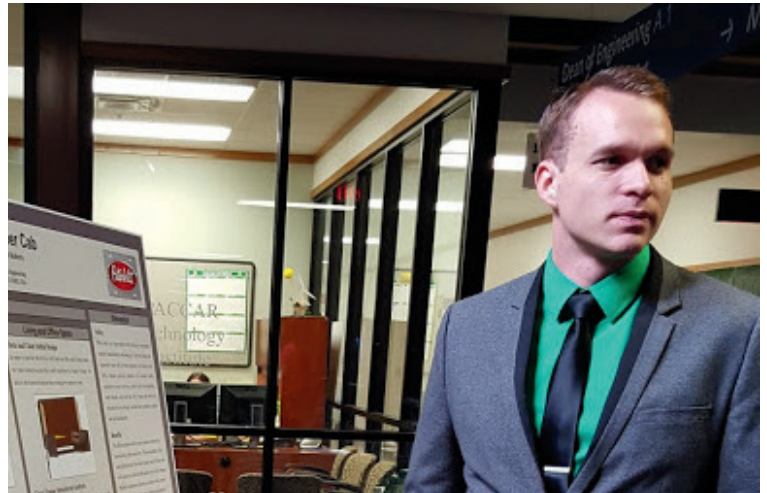
 CHANGLI XIA

And he's not stopping there; Xia's next goal is to be a recognized and distinguished scientist in his research area. "I really want to make an impact in developing sustainable bioproducts and help bring them to everyday life for a cleaner healthier planet," Xia said. He says that students looking to make a name for themselves should work hard and find a specialty. "Find out your own preference for your future career – for instance – academic or industrial? Then, specifically focus on the goal to develop the skills."

ALUMNUS ALEX REESE SHARES MEMORIES OF HIS TIME AT UNT

 ERIN ALLICE

Alex Reese received his M.S. in Mechanical and Energy Engineering in December 2016. Since graduating from UNT, he has worked as a structural analysis engineer at Northrop Grumman in Florida where he performs structural and stress analysis on metal and composite aircraft parts.



Alex Reese

 ALEX REECE

He says the expertise gained from his UNT master's degree has proven invaluable. "When I step into work, I utilize the knowledge and skills that my UNT degree provided me," he said. "The knowledge that came from courses such as differential equations, mechanics of materials, and dynamics. This also includes skills that were obtained from writing design and lab reports while working on group projects throughout my coursework."

The foundation that the master's degree provided allowed Reese to expand his skillset. "Since beginning work as a structural engineer, I have learned how to model, analyze, post-process and report my findings using top-of-the-line software the industry has to offer," Reese said. "I've also begun to learn how to properly network and develop professional relationships with individuals from varying backgrounds."

UNT degrees come with more than just the degree. As a UNT alumni, one becomes part of the mean green family. "One of my fondest memories from UNT was when I was giving a tour of the engineering building to a prospective student and her family. Throughout the tour, students were constantly greeting or waving at us as we passed by. After the tour, the prospective student made a remark about how 'popular' I must be, to which I just laughed," he said. "It wasn't until later that week that I realized how many friends, both students and faculty alike, I had made in my years at UNT and how we were all just one big, happy, nerdy family that were always excited to see one another on campus."

Some advice Reese has for future and current mechanical and energy engineering students is to diversify their coursework, to network with fellow students, and seek internships. "Being an engineer is challenging, and it doesn't magically get easier once you enter the 'real world.' Enjoy your time at UNT while making friends that will last a lifetime."

MEEN AT ASME IMECE CONFERENCE



NATARSHA JOSEPH-HALL, ERIN ALLICE, OMAR ALMAHMOUD



NOV. 5-9 2017, TAMPA, FLORIDA



WEIHUAN ZHAO



XUN YU, KURUVILLA JOHN



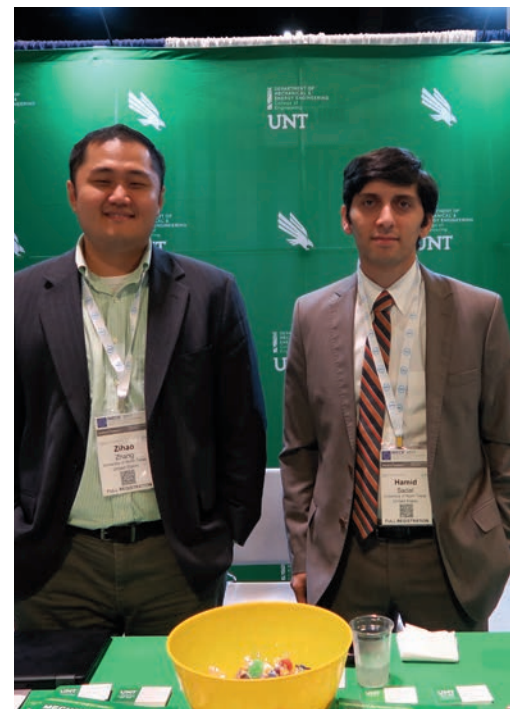
RAMAKRISHNA KOGANTI



OMAR ALMAHMOUD, KURUVILLA JOHN, YONG TAO



NATARSHA JOSEPH-HALL, KURUVILLA JOHN, ZIHAO ZHANG, OMAR ALMAHMOUD, HYEONU HEO



ZIHAO ZHANG, HAMID SADAT



Celebrating 10 Years



Alumni rush to Nandika D'Souza's side, eager for a memorable photograph. Faculty share laughs as they reach out to each other for conversation. The chair, Kuruvilla John, gleefully jokes and greets everyone he sees. Students hover around familiar faces, smiles abound. This was the joyous feeling expressed among the party-goers of the Department of Mechanical and Energy Engineering's Ten Year Anniversary Gala. A perfect example that showcases the department's strong, familial bonds that form over the course of each individuals' time here.



The evening consisted of a lively crowd filled with amazing food, competitive auction (FYI: Ranger Tickets go fast!), memorabilia photography and plenty of noise and laughter. Emotions were light when former chair, Yong Tao, gave a few supportive words and students expressed gratitude and love to the department in commencement speeches. People dispersed slowly, unwilling to part from one another, as they carried their proud MEEN gifts.

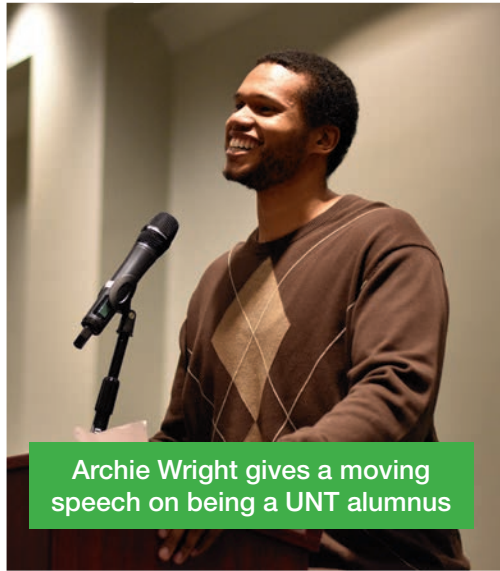


The night was full of unity and one to burn into memory thanks to all our students, faculty, staff and alumni who came and celebrated with us. Thank you, MEEN is looking forward to many more successes in the decade ahead.

Thank you to our guest speakers former Dean Costas Tsatsoulis, Constant Marks, Archie Wright, Mariela A. Alvarez and Robert Smith.



MEE Chair Dr. Kuruvilla John and Associate Dean Dr. Nandika D'Souza greet alumni



Archie Wright gives a moving speech on being a UNT alumus



Former Dean Costas Tsatsoulis congratulates the MEE department on 10 years







There is a strong future ahead for the department and our students with constant possibilities opening around every corner. Without a doubt, our students are growing into individuals who will help the world develop for the better due to the access to outstanding faculty, supportive staff and fantastic state-of-the-art equipment. And so much of this is thanks to alumni, stakeholders and the generosity of everyday people!

The MEEN department cannot thank you enough for every bit of help provided to our students.

Thinking about supporting the Mechanical and Energy Engineering department? Take a look at all that you can do to assist us in providing the world with strong and impactful mechanical and energy engineers!

- Major gifts and endowments
- Industry sponsorships of projects
- Internship connections
- Donations (both material and financial)
- Guest speakers
- Student mentoring
- Adjunct teaching
- Join our External Advisory Board (EAB)

If any of these interest you, please connect with the department for more information!



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