COLLEGE of ENGINEERING

VIEWBOOK

NM STATE

BE BOLD. Shape the Future.®
New Mexico State Univeristy

WELCOME

I am delighted that you are interested in the New Mexico State University College of Engineering. This is an exciting time to consider pursuing a degree in engineering, with an amazing array of specialties to study and career paths to follow. I am confident you will find NMSU a great place to begin your academic journey.

As the oldest engineering college in the state, our century-plus history is one of student-centered education. In the second decade of the 20th century the atmosphere of the college was described as "… one of goodwill, hard work and mutual support."

I am proud to say that is still an accurate description, with professors who will know you by name, facilities and programs designed to help you and provide resources to make sure that you succeed. Among the many student-based programs unique to Aggie Engineering, you will have access to:

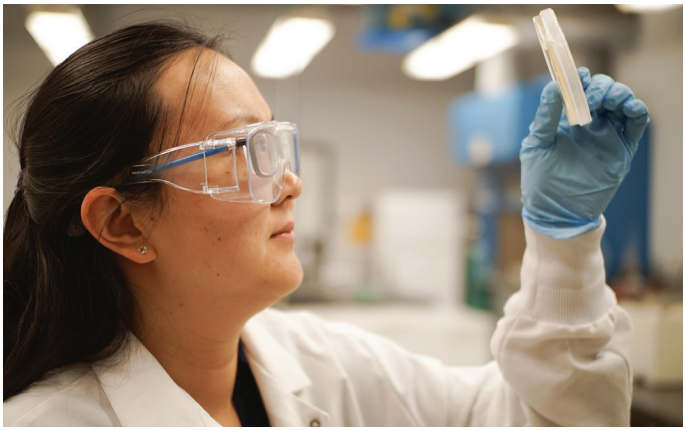
- One of the biggest pools of scholarship funds available on the NMSU campus
- Tutoring and mentoring, and a place where you can meet with friends to study or work on projects in the Eloy Torrez Family Learning Communities
- A great beginning with a solid understanding of the basics for engineering coursework through curriculum specifically designed to support incoming freshmen
- Opportunities for hands-on experience with projects and research, working with industrial professionals and our leading-edge researchers
- More than 30 engineering student organizations to get involved in, make friendships and share experiences
- A chance to explore your innovative and entrepreneurial side in the Aggie Innovation Space, equipped with more than $1 million in the latest design and manufacturing technology
- One of the Southwest's biggest career fairs, which can lead you to valuable internships, co-ops and employment with some of the leading engineering employers

Our faculty and staff lead cutting-edge research in areas that span water quality to satellite communications. Our strong partnerships with industry, Sandia and Los Alamos National laboratories, the Air Force Research Laboratory, White Sands Missile Range and Spaceport America strengthen relevance and application of our programs both in and out of the classroom, ensuring a successful future for our graduates.

I invite you to learn more about our programs and see how you can join the ranks of other Aggie Engineers.

Lakshmi N. Reddi, Ph.D., P.E.
Dean, College of Engineering

Define Your Future



As an engineering student at NMSU, you will join the ranks of Aggie Engineers across the globe who are shaping the future. From the first courses offered in civil and mechanical engineering more than a century ago, NMSU's College of Engineering continues to garner national rankings in research, teaching and service. As a land-grant institution, we pride ourselves in providing the best-of-the-best for our students. From hands-on learning experiences to research opportunities working alongside recognized faculty, NMSU engineering students are afforded a quality education in a supportive environment that helps students shape the course of their own success. As a result, our graduates are competitive both in the workforce and in pursuit of advanced degrees.

Be Bold

NMSU engineering students think and act boldly. They move forward, turning knowledge into action. Join us in stretching the boundaries of the possible as we think and work boldly to break new ground and refuse to let barriers define us. Turn your knowledge to action and break new ground. Your NMSU engineering degree might lead you to:

- Develop technologies to provide clean drinking water
- Create robotic limbs for amputees
- Design the next generation of satellites and drones
- Discover safe, reliable ways to deliver electricity
- Implement innovative, safe and cost-effective systems and manufacturing processes
- Perfect cutting-edge communication systems for Earth and space applications
- Develop life-changing bio-medical applications and new materials such as nano-films

Our bachelor's degree programs will prepare you for a bold new future. Choose from 13 programs leading to a multitude of engineering and technology careers or advance your learning through cutting-edge research as a graduate student.

NMSU's College of Engineering is the sole provider in New Mexico for degrees in:

- Aerospace Engineering
- Engineering Technology
- Engineering Physics
- Industrial Engineering
- Information and Computer Technology
- Surveying/Geomatics Engineering

AEROSPACE Engineering

B.S., M.S. and Ph.D.

As an aerospace engineer, you might create aircraft that weigh more than a half a million pounds or spacecraft like the International Space Station that moves at approximately 17,000 miles per hour. Aerospace engineers are innovative research leaders in the design, development and analysis of commercial and defense-related aircraft, drones, spacecraft and satellites. They also supervise the manufacture of these products.

NMSU is the hub of New Mexico's fast-growing commercial and military aerospace research and development activity. We have the state's only aerospace engineering program. Our ties to Spaceport America, three national research laboratories, three Air Force bases, and three testing facilities with access to restricted air space make this the ideal place to become an aerospace engineer, and help with research as an undergrad.

DID YOU KNOW?

NMSU has been the lead university of the New Mexico Space Grant Consortium, administered by NASA, since 1989. The consortium provides funding to faculty and students to develop competitive aerospace-related research and technology projects across New Mexico.

CHEMICAL and **MATERIALS** Engineering

B.S., M.S., M.E.C.P.I, Ph.D.

Chemical engineers work in manufacturing, pharmaceuticals, healthcare, design and construction, petrochemicals, food processing and beverage industries, specialty chemicals, microelectronics, electronic and advanced materials, polymers, biotechnology, and environmental health and safety industries among others. They rely on their knowledge of mathematics and science — particularly chemistry — to address technical problems safely and economically. Chemical engineering is also a great way to advance your career into areas of law, finance and medicine.

At NMSU, you can even expand your knowledge of the beverage industry through NMSBrew, a new program designed to prepare students for careers as brewing engineers in the emerging craft brewing industry.

CIVIL Engineering

B.S., M.S., M.E.C.E., Ph.D.

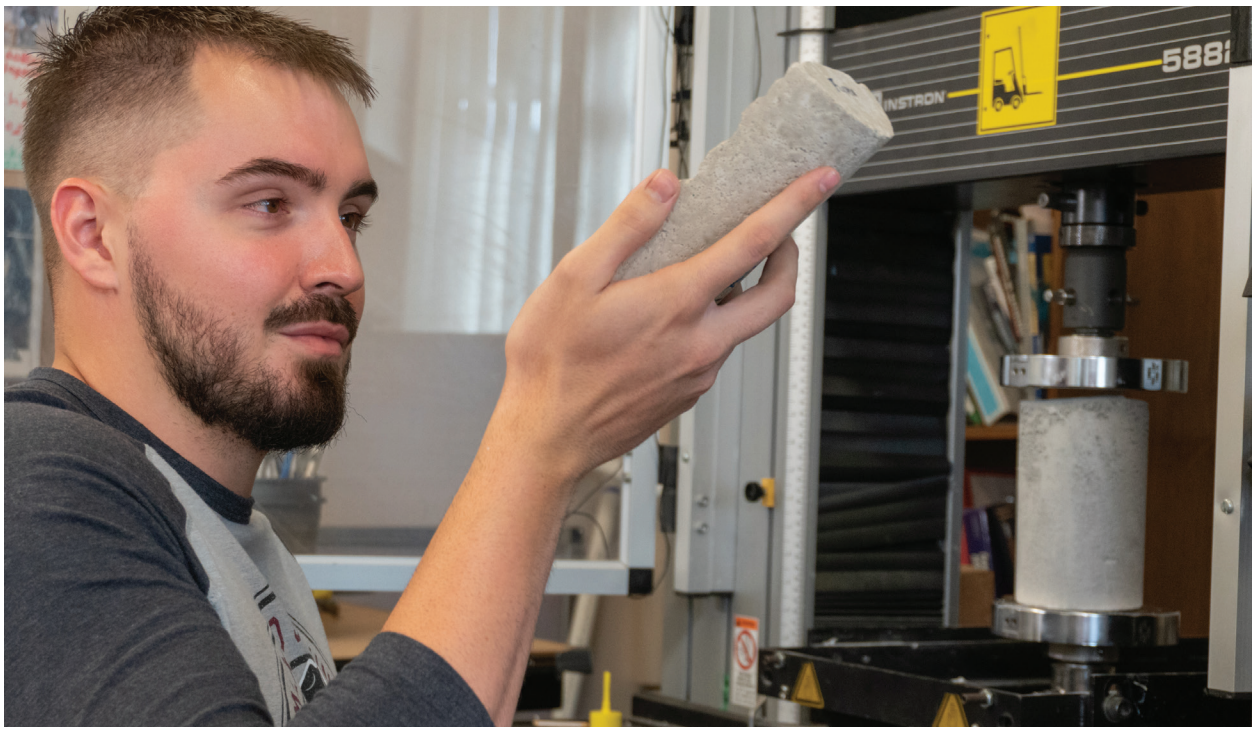
Civil engineers design, build and maintain the physical infrastructure of our communities, including freeways, high-rise buildings, bridges, dams, roads, airports and water treatment plants. Civil engineers plan and supervise construction and preservation of these facilities. They also work to address emerging needs for advanced technologies for ground stabilization, high-performance materials, intelligent transportation systems, remote sensing, renewable energy, resilient infrastructure, structural health monitoring, sustainable construction, traffic modeling and simulation and water conservation.

DID YOU KNOW?

NMSU civil engineering faculty members are research leaders in wastewater treatment, water conservation, desalination, management, and the treatment and reuse of produced water used in oil and gas production.

CIVIL Engineering Technology

B.S.



Students in this field of study learn to link theory with application. Civil engineering technologists support the planning, analysis, design and construction of highways, buildings, bridges, dams and wastewater treatment systems. They also serve as project managers, estimate construction costs, specify materials needs, and assist in monitoring instrumentation. Specialty courses include properties of construction materials, blueprint reading, surveying/geomatics, the design of structures, highway technology, land development and infrastructure, hydraulics, and construction management.

"Before I began my major at NMSU in engineering, I had always been unsure if it was what I wanted to do the rest of my life. However, after having the great opportunity of interning at Emery Sapp and Sons in Kansas City, Missouri, I was able to develop my professional, academic and personal goals. Now, I have a better idea of what I want to do with my career."

–YOMARA RIOS-LAURENZANA
CIVIL ENGINEERING TECHNOLOGY

ELECTRICAL and **COMPUTER** Engineering

B.S., M.S., M.E.E.E, Ph.D.

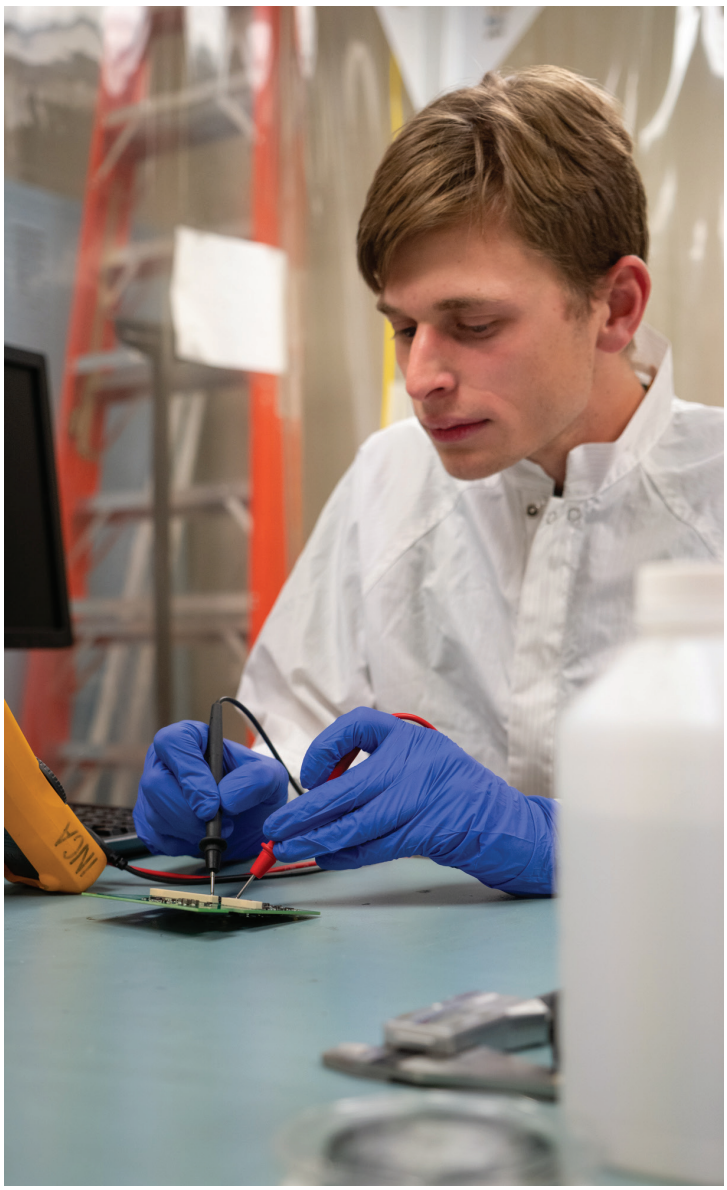
Electrical and computer engineers make the world come alive. They put the digital touch in everything from aircraft, cars, cameras and computer hardware to drones, medical equipment, satellites and video products. They also create the telecommunications pathways and energy delivery systems that have become critical in today's world. Electrical and computer engineers are involved in every aspect of our lives, including emerging areas of artificial intelligence, cyber-security and machine learning.

If they have a particular interest, our students have the opportunity to specialize in one of the following concentration areas:

- Communications and Signal Processing
- Computers and Microelectronics
- Control and Power Systems
- Electromagnetics and Photonics
- Space Systems

ELECTRONICS and **COMPUTER** Engineering Technology

B.S.



This field of study focuses on the integration, test and evaluation of electronic and computer systems. Graduates from this program pursue careers in industries such as power companies, aeronautics, medical electronics, computers, broadcasting, telecommunications, factory automation and robotics. They also are integral members of engineering teams focused on applied design, product development, manufacturing, production and technical operations.

> Being a student at NMSU has exposed me to different career paths and helped me to determine my interests. The opportunities I have had here to develop both technical and occupational skills give me confidence in professional environments.
>
> **–ADRIANNA SANDERS**
>
> **MECHANICAL ENGINEERING**
>
> **AZTEC HIGH SCHOOL GRADUATE**

ENGINEERING Physics

B.S.

Engineering physics combines the application of basic physical principles with traditional engineering disciplines. Engineering physicists create some of today's most exciting technologies by manipulating the world at the cellular level through nanotechnology: creating machines, controls and sensors that are smaller than a grain of salt. They move massive amounts of information faster than ever before through fiber-optic technology, and design laser technologies used in fields as diverse as medicine and defense.

DID YOU KNOW?

NMSU offers the only engineering physics degree program in the southwest. This multi-disciplinary degree program offers concentrations in aerospace, chemical, electrical and mechanical engineering.

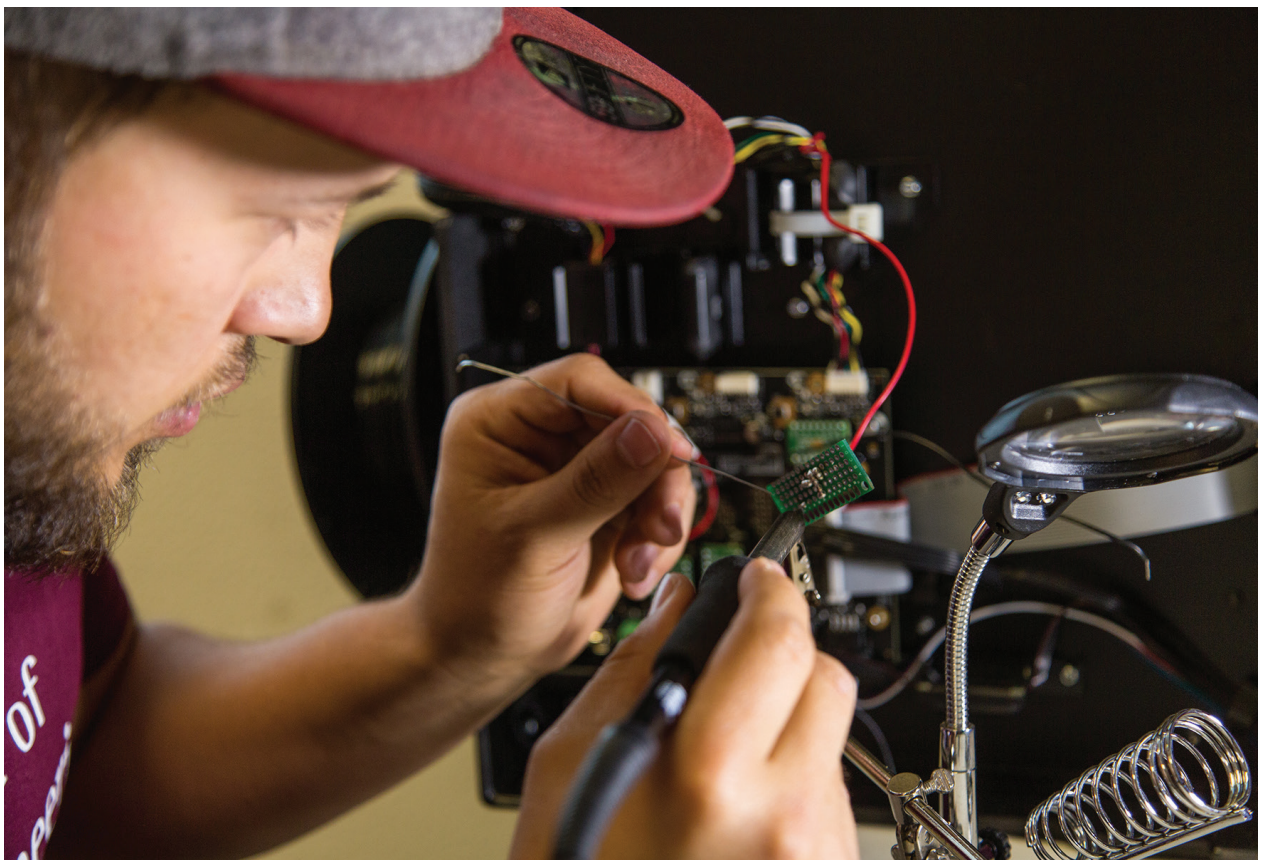
INDUSTRIAL Engineering

B.S., M.S, M.E.I.E, M.E.A.E., Ph.D.

Industrial engineers stand out among the engineering disciplines for their multi-disciplinary expertise. Industrial engineers look at the big picture and identify ways to make things better by improving systems, processes and products. They focus on increasing quality, safety and profitability by providing innovative solutions to complex problems. They utilize specialized knowledge in the mathematical, physical, and social sciences along with the principles and methods of engineering analysis and design. Their expertise is highly sought after across all enterprises operating in today's global economy, including agribusiness, health care, manufacturing, aerospace defense, transportation, auto manufacturing and finance.

INFORMATION and Communication Technology

B.I.C.T



Information and communication technology is a completion distance education program, offering junior- and senior-level coursework for students who have already completed certain prerequisites to earn their bachelor's degrees. Topical program areas include Java and web design, information security, computer forensics, Oracle database management, Unix/Linux system administration, and networking and LAN systems.

The curriculum covers the topics and concepts that are required to design, implement and manage a variety of computer-based information systems. Graduates with these skills are highly employable. The program is well-suited for students with an associate degree in a computer or technology-field.

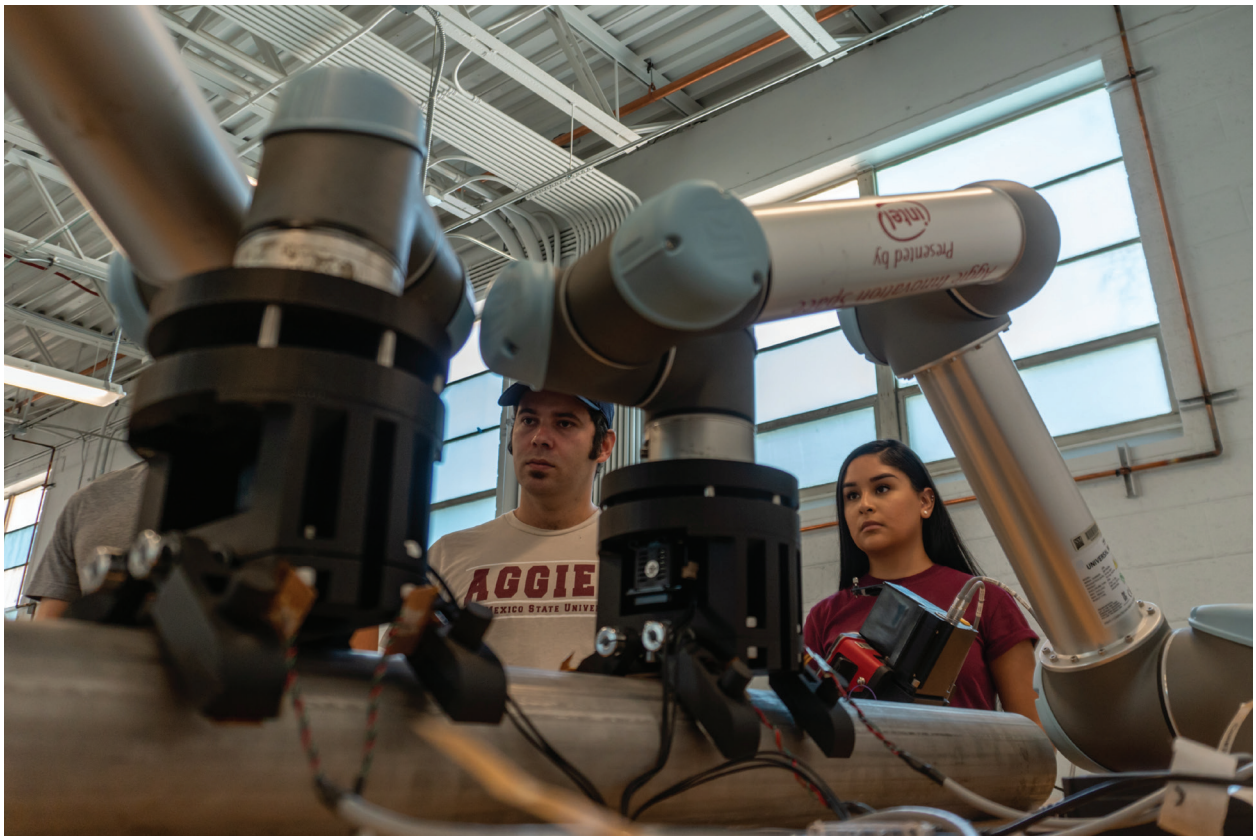
SURVEYING/GEOMATICS Engineering

B.S.

Defining boundaries and measuring land has been an important part of human endeavors since the beginning of recorded history, but today relies on modern methods and equipment such as unmanned aerial vehicles and GPS technology. Whether it is determining the shape of a nation or specifying the path of a new highway, our world is defined by surveying. Geomatics and surveying engineers analyze, design and execute surveying and mapping projects. In addition to knowledge of the mathematical and computational methods involved in surveying measurement and analysis, they also have an understanding of the legal principles of boundary location and the laws related to boundaries and land use.

MECHANICAL Engineering

B.S., M.S, M.E.M.E., Ph.D.



If it moves, chances are, a mechanical engineer designed it. Mechanical engineers apply the principles of engineering, physics, mathematics and materials science to design, analyze, manufacture and maintain mechanical systems. These include machines as simple as a bicycle or as complex as the latest military jet. Mechanical engineers often design things that aren't machines, and are involved in the creation of a wide range of devices, components and systems — from the ordinary, such as packaging for products, to the amazing, such as artificial organs. Graduates from the program have pursued careers in aerospace, space, defense, automotive, health care, robotics, power and utility systems, oil and gas, renewable energy, manufacturing, and have also started their own companies.

MECHANICAL Engineering Technology

B.S.

Mechanical engineering technology majors learn theory and hands-on applications in the fields of manufacturing, product design and development, power systems, machinery — mechanisms, computer-aided modeling and instrumentation, heat transfer and fluids, to name a few. METs learn the implementation of current mechanical engineering practices through the application of mathematics and engineering science to design problems and the operation and testing of engineering and mechanical systems. The growing demand for modern and complex industrial machinery, machine tools and computer-controlled processes makes the employment outlook excellent for graduates from this program. Graduates from the program have pursued careers in areas of test and evaluation, manufacturing, product development, and oil and gas industries.

> NMSU offers many opportunities and experiences for students to explore, which helped me understand the future I wanted, but more importantly, NMSU provided me with the tools to turn that future I wanted into the reality I am living now.
>
> **–NATALIA PEREZ-PEREZ**
> **NEW MEXICO STATE UNIVERSITY/**
> **UNIVERSITY OF CHIHUAHUA**

FIND YOUR COMMUNITY

Eloy Torrez Family Learning Communities

Foreman Engineering Complex Room 300

ENGR.NMSU.EDU/STUDENTS/THIRD-PAGE.HTML

The Eloy Torrez Family Learning Communities were developed by alumni and industry partners who recognize that learning styles differ across our diverse and engaged student population and wanted to remove barriers to learning to ensure student success. The learning communities provide access to tutoring assistance for most engineering courses, study sessions, mentoring from industry partners, and an inviting place for students to meet with friends to do homework or collaborate on student projects.

Home to more than 30 engineering student organizations, the learning communities gives you a place to connect with other students, become involved in college activities, and have access to great academic and career resources.

DID YOU KNOW?

The NMSU geomatics/surveying engineering program is the only of its kind in the state and has a 100% post-graduation employment rate.

Shape the Course of Your Success

At NMSU, we challenge our students to take command of their academic success by providing them with the tools and support to succeed. Individually and collectively, the NMSU community — faculty, staff and students — works together to explore the possibility of what could be.

Engineering Ambassador Program

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The NMSU College of Engineering Ambassador program provides undergraduate students with opportunities to expand personal and professional growth. They gain leadership skills and a deeper understanding of challenges here and worldwide.

Participating students are selected based on their interest in serving NMSU's College of Engineering, broadening their leadership skills, and a commitment to ethical values.

Engineering Ambassadors provide support for activities related to recruiting, retention, outreach, and most importantly, student success. Ambassadors provide campus tours, serve as representatives of the NMSU College of Engineering, engage in leadership discussions, and perform duties at various campus and community events.

Aggie Innovation Space

INNOVATE.NMSU.EDU

The Aggie Innovation Space is a series of facilities where students can go for hands-on engineering and see their projects come alive. The facilities and staff enable students to fabricate and prototype, conduct engineering analysis and manufacture finished products for student projects as well as entrepreneurial endeavors. AIS facilities were recently equipped with more than $1 million of the latest high-tech equipment, machinery and tools, including 3D printers, a water-jet cutter, advanced electronics, robotic arms and design software. Experienced machinists and mentors assist students with projects and teach them about the engineering process and how to use this equipment.

Ron Seidel Engineering Leadership Institute

ENGR.NMSU.EDU/STUDENTS/TENTH-PAGE.HTML

Engineering isn't just about numbers, designs and materials — it's about leadership. Engineering today is a team-based, multidisciplinary endeavor that requires the ability to work with diverse groups of people, communicate effectively and develop entrepreneurial skills. This two-year program for juniors and seniors helps students develop the essential interpersonal and intrapersonal skills that they will need to become successful leaders in engineering careers.

ONE APPLICATION, HUNDREDS OF OPPORTUNITIES

NMSU provides one of the best educational values in the country. In addition to federal, state and university-based scholarships, the College of Engineering has one of the largest pools of scholarship funds on campus. Our scholarships vary in amount and are awarded based on a broad spectrum of criteria for freshmen, out-of-state, transfer and continuing students.
Visit **SCHOLARSHIPS.NMSU.EDU**.

APPLY FOR SCHOLARSHIPS WITH ONE APPLICATION

One application is all it takes to be considered for all university-wide AND engineering scholarships.

NMSU accepts scholarship applications from Oct. 1 through March 1. Admission to NMSU is required to be eligible for campus-wide financial aid and scholarships. To be eligible for engineering scholarships, you also must be admitted to the College of Engineering.

Follow the process below to complete your scholarship application:

1. Complete a Free Application for Federal Student Aid (FAFSA) at **FAFSA.ED.GOV**. List NMSU as your school of choice on the FAFSA.
2. Fill out the ScholarDollar$ application online at **SCHOLARSHIPS.NMSU.EDU** before March 1.

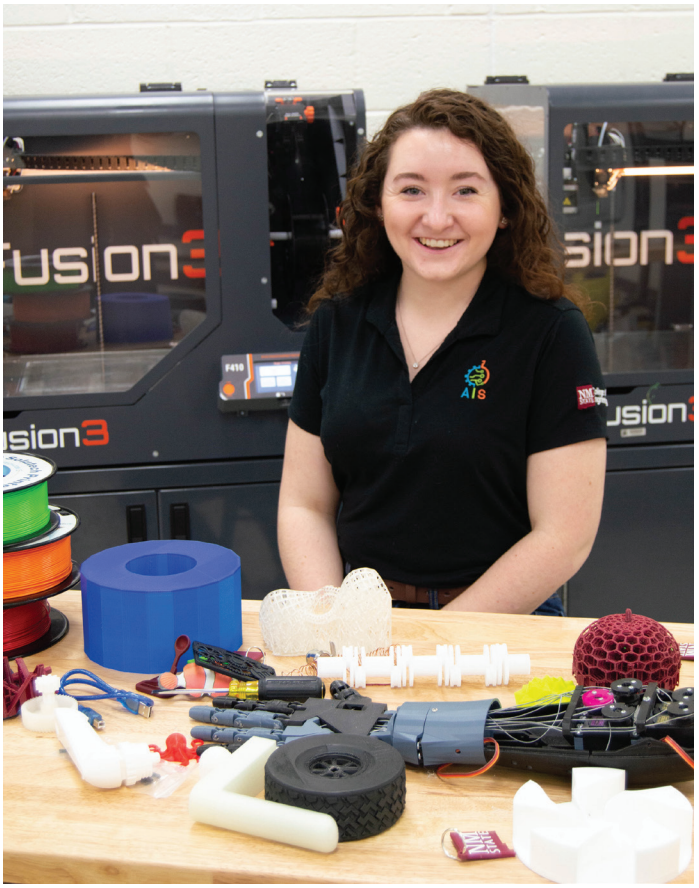
Other Sources of Support

The New Mexico Alliance for Minority Participation, **NMAMP.NMSU.EDU**, offers scholarships to engineering students who have participated in various STEM programs while in high school.
TRIO STEM-H, **STEMH.NMSU.EDU/APPLY**, provides services to low-income, first-generation, and students with disabilities pursuing degrees in science, technology, engineering, math and health sciences.

"Scholarships are helping me get one step closer to my dreams by allowing me to focus on my classes and not on how I am going to be able to pay for them. Avoiding financial stress and school debt has been extremely beneficial in my success at NMSU. Receiving scholarships has shown me that hard work really does pays off, and encourages me to work even harder for my future's best interest. My goals have never been closer in reach and all thanks to the amazing scholarships that NMSU has to offer. Go Aggies!"

–GUILLERMO J-D SOLTERO,
CHEMICAL AND MATERIALS ENGINEERING

EARN COLLEGE CREDIT IN HIGH SCHOOL



We welcome high school students through NMSU's Dual Credit Program, which allows juniors and seniors the opportunity to get a jump-start on their college education. Qualified students can enroll in approved college-level courses and receive college credit from NMSU, as well as elective high-school credit from their high school, simultaneously. Dual credit is a great way to jump start your path to become an Aggie Engineer. Learn more at **DUALCREDIT.NMSU.EDU**.

Transfer from Another Institution

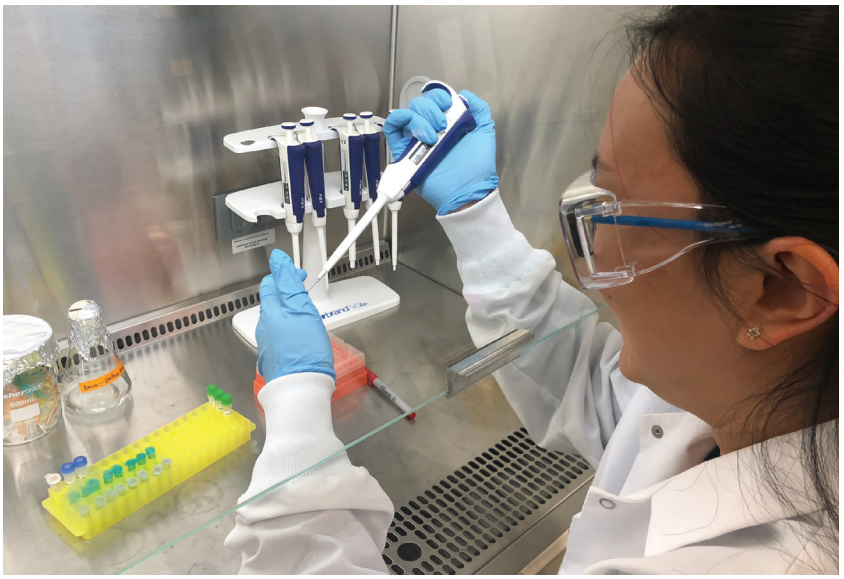
We have dedicated advisers to help you through the transfer process. We provide all the help you need to make our College of Engineering your next step. All the information you need can be found at the NMSU Transfer Center.

If you are currently enrolled at one of NMSU's community college campuses, the process is even easier. Many of our engineering programs have transfer agreements with New Mexico community colleges for students who want to further their academic pursuit for a bachelor's degree in engineering. Start here: **ADMISSIONS.NMSU.EDU/HOW-TO-APPLY/TRANSFER-STUDENTS/**.

Transfer Your Military Credits

NMSU is a military and veteran friendly university and engineering is a popular choice. Check out transfer information and then find additional resources available through the NMSU Military and Veterans Programs at **MVP.NMSU.EDU**.

DISCOVER A WORLD OF OPPORTUNITY



As an engineering graduate of NMSU, you will have plenty of career options. With a Bachelor of Science or advanced degree in engineering, you will be well prepared to pursue a career in industry, government, academia, or even start your own company. NMSU holds the largest annual career fair in the region with the majority of employers seeking to hire engineering students.

Our national industry partnerships offer cooperative education programs, internships and summer programs, giving you hands-on, career-related work experience. NASA, Raytheon, Johnson & Johnson, ExxonMobil and Cummins, for example, provide work experiences complementing your classroom learning and giving you a valuable advantage for future employment.

Make Your Future Happen

The Center for Academic Advising and Student Support is your go-to destination for Career Exploration and Career Advising. From resume and cover letter reviews to mock interviews and setting up your career-centric digital profiles, we're here to help.

SSC.NMSU.EDU/CAREER-DEVELOPMENT

"I worked at Los Alamos National Laboratory as a research and development engineer student intern at a test facility that support the laboratory's primary mission of ensuring and validating the safety, reliability, and performance of the nation's nuclear stockpile.

I learned countless new skills, specifically mechanical engineering design skills. At the conclusion of my time on the project, i had engineered, modeled and drafted drawings for three diagnostic target designs.

My internship experience at LANL was extremely valuable. I was able to perform in a real-world engineering environment and apply knowledge i had learned at NMSU. The amount of experience gained from working one summer was tremendous."

–DAVID MIGNARDOT, MECHANICAL AND AEROSPACE ENGINEERING

TAKE IT TO THE NEXT LEVEL

Thinking about graduate school? Now is a good time to plan. You could earn both a bachelor's and master's degree in as little as five years through the Master's Accelerated Program. It's not as time consuming as you might think. It's possible to complete the master's degree in 2-3 semesters beyond graduation with a bachelor's degree. It could be even less if you do a qualifying research project to fulfill some thesis requirements.

A master's degree is increasingly becoming the professional degree of choice for engineering practice. Many employers encourage or even require their employees to seek the degree during their early career and master's holders often experience increased upward mobility and earn substantially greater salaries as a result. Another exciting path might lead you to pursue a passion for research with a doctoral degree.

Our six departments offer the following advanced degrees:

- Aerospace Engineering: M.S. and Ph.D.
- Chemical Engineering: M.S., Ph.D. and M.E.C.P.I (Master of Engineering in Chemical Process Industry)
- Civil Engineering: M.S., Ph.D. and M.E.C.E. (Master of Engineering in Civil Engineering)
- Electrical and Computer Engineering: M.S., Ph.D. and M.E.E.E. (Master of Engineering in Electrical Engineering
- Environmental Engineering: M.S.
- Industrial Engineering: M.S., Ph.D., M.E.I.E. (Master of Engineering in Industrial Engineering) and M.E.A.M. (Master of Engineering in Advanced Manufacturing)
- Engineering Technology and Surveying Engineering: M.E.I.T. (Master of Engineering in Information Technology)
- Mechanical Engineering: M.S., Ph.D., and M.E.M.E (Master of Engineering in Mechanical Engineering)

Accelerate Your Path to a Master's Degree

You could earn both a bachelor's and master's degree in as little as five years through the Master's Accelerated Program.

It's not as time consuming as you might think. It's possible to complete the master's degree in 2-3 semesters beyond g raduation with a bachelor's degree. It could be even less if you do a qualifying research project to fulfill some thesis requirements.

DID YOU KNOW?

Engineers who earn master's degrees can earn starting salaries $10K to $47K more than those with bachelor's degrees depending upon their specific discipline, as reported by Prodigy Finance.

EXPLORE NEW EXPERIENCES AT NMSU

As an Aggie engineer, you will have an array of opportunities to meet new people and learn new things through more than 30 engineering student organizations. National engineering honor societies and student chapters of professional engineering organizations offer opportunities to perform community service projects, advance your leadership skills, showcase your projects and research and network with other students and professional engineers. See a complete list at **ECOUNCIL.NMSU.EDU**.

One such organization is Aggies Without Limits. Since 2007, hundreds of NMSU students, staff, faculty and community members from all backgrounds and disciplines have participated in AWL projects to serve our local communities and Latin American countries. Over the years, AWL's projects have improved the lives of countless people, spread international and local goodwill, and changed the lives and perspectives of students who continue to carry on acts of humanity beyond their time as students. The group has changed lives all over the world in ways that can't be measured.

Atomic Aggies

Students design and build rocket payloads in competitions hosted by NASA, Spaceport America, and others and gain hands-on experience in payload building and integration.

Biomedical Engineering Society

Students develop biomedical-related projects for competition, learn leadership and networking skills, and have an opportunity to participate in career development programs that advance student interest in biomedical engineering careers.

Society of Automotive Engineers Baja

Students work together as a team to design, test, and manufacturing a working prototype of an off-road vehicle for participation in regional and national SAE Baja competitions.

Student Competitions

- American Institute of Aeronautics and Astronautics Design Build Fly Competition
- American Society of Civil Engineers Steel Bridge Competition
- American Institute of Chemical Engineers Chem-E-Car Competition®
- Society of Automotive Engineers International Mini Baja Contest
- Associated General Contractors of America Building Competition
- National Society of Professional Surveyors Student Competition
- National Collegiate Cyber Defense Competition

BE BOLD. Shape the Future.®
College of Engineering

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social media from allmylinks.com/nmsu-engineering

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