NEW MEXICO INSTITUTE OF MINING AND TECHNOLOGY

New Mexico School of Mines opened its doors on September 5, 1893

FOUNDED
1889 as the New Mexico School of Mines.

NOW
- 18 Science and engineering departments
- 1900 Undergraduate and graduate students
- More than 50 graduate degree programs
- World class research

NOTABLE ALUMNI

CONRAD HILTON
Founder of the Hilton Hotels chain

LUKAS LUNDIN
Swedish-Canadian billionaire businessman

TERRY WALLACE
Former Director of Los Alamos National Laboratory

ED FRIES
Entrepreneur and co-founder of Xbox

SUSAN PACKARD ORR
American philanthropist and the former chair of the Board of Directors of the David and Lucile Packard Foundation

STATE OF NEW MEXICO

Great weather
Beautiful sunsets
Rich history
Diverse culture
Amazing outdoors

HOME OF
Los Alamos National Laboratory
Sandia National Laboratories
Kirtland Air Force Base
Industries such as aerospace, defense, solar energy, and semiconductor manufacturing
NMT'S RESEARCH CENTERS

ICASA
The Institute for Complex Additive Systems Analysis (ICASA) is a cooperative alliance among academia, industry, and government that New Mexico Tech administers under a contract with the Department of Defense, along with the support of the state of New Mexico. This alliance is dedicated to studying the behavior, vulnerabilities, and predictability of complex systems.

EMRTC
The Energetic Materials Research and Testing Center (EMRTC), a major research and training division of New Mexico Tech, is internationally recognized and has over 60 years experience in explosives research and testing. EMRTC specializes in the research, development, testing, and analysis of energetic materials for both corporate and government clients.

MRO
The Magdalena Ridge Observatory (MRO) is located on 1,000 acres at 10,600 feet in the Magdalena Mountains of the Cibola National Forest in Socorro County, New Mexico (NM). This multi-use research and educational observatory is built and operated by New Mexico Tech (NMT).

LANGMUIR
Langmuir Laboratory, built by New Mexico Tech in 1963, is located at an elevation of 3,240 m (10,630 ft) in the Magdalena Mountains, 27 km (17 air miles) southwest of the Socorro campus. The laboratory was named in honor of Dr. Irving Langmuir, Nobel Prize winner, who participated in numerous experiments at Tech related to cloud physics after the discovery of cloud seeding in 1946.

PRRC
The Petroleum Recovery Research Center (PRRC), the only research center of its kind in New Mexico, is a scientific research organization dedicated to solving problems related to the oil and gas industry. The PRRC’s mission is to develop, through theoretical and practical research, improved oil recovery methods to increase oil and natural gas recovery from New Mexico’s and the nation’s oil and gas reservoirs and to transfer new technology to the industry and to local independents. In recent years the PRRC has been a leader in carbon sequestration research.

CYBER SECURITY
New Mexico Tech developed two closely-related cybersecurity centers, one focused on cybersecurity education and the other focused on economic development for New Mexico.
ENGINEERING
Graduate Programs

BUSINESS AND TECHNOLOGY MANAGEMENT
Technology Leadership Certificate
Master of Engineering Management (MEM)

CIVIL AND ENVIRONMENTAL ENGINEERING
Master of Science in Environmental Engineering

COMPUTER SCIENCE AND ENGINEERING
Graduate Certificate in Cybersecurity
Master of Science in Computer Science
Master of Science in Computer Science with Specialization in:
- Information Technology
Doctor of Philosophy in Computer Science

ELECTRICAL ENGINEERING
Graduate Certificate in Electrical Engineering
Master of Science in Electrical Engineering
Doctor of Philosophy with Dissertation in:
- Cyber Electronic Systems
MATERIALS AND METALLURGICAL ENGINEERING
Doctor of Philosophy in Materials Engineering

MECHANICAL ENGINEERING
Master of Engineering and Master of Science in Mechanical Engineering with Specialization in:
- Explosives Engineering
- Fluid and Thermal Sciences
- Mechatronics Systems and Robotics
- Solid Mechanics

Doctor of Philosophy in Mechanical Engineering with Dissertation in:
- Intelligent Energetic Systems

MINERAL ENGINEERING
Master of Science in Mineral Engineering
Master of Science in Mineral Engineering with Specialization in:
- Mineral Exploration
- Geotechnical Engineering
- Explosive Engineering

PETROLEUM ENGINEERING
Master of Science in Petroleum Engineering
Doctor of Philosophy in Petroleum Engineering
**Biology**
Master of Science in Biology

**Chemistry**
Master of Science in Chemistry
Master of Science in Chemistry with Specialization in:
- Biochemistry
Doctor of Philosophy in Chemistry

**Earth and Environmental Science**
Graduate Certificate in Hydrology
Master of Science in:
- Geochemistry
- Geology
- Geophysics
- Hydrology
Professional Masters in Hydrology
Doctor of Philosophy in Earth and Environmental Science with Dissertation in:
- Geobiology
- Geochemistry
- Geology
- Geophysics
- Hydrology
**MATHEMATICS**

Graduate Minor in:
- Applied and Industrial Mathematics
- Operations Research and Statistics
- Numerical Analysis or Analysis

Master of Science in Mathematics with Specialization in:
- Analysis
- Industrial Mathematics
- Operations Research and Statistics

Doctor of Philosophy in Applied and Industrial Mathematics

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**PHYSICS**

Graduate Minor in Physics

Master of Science in Physics

Doctor of Philosophy in Physics

Doctor of Philosophy in Physics with Dissertation in:
- Astrophysics
- Atmospheric Physics
- Mathematical Physics

Doctor of Philosophy in Physics with Specialization in:
- Instrumentation
TRANSDISCIPLINARY Graduate Programs

Transdisciplinary research and education integrates research methods, theories, techniques, and perspectives of multiple disciplines to develop new approaches to solve complex, real-world challenges.

BIOLOGY
Doctor of Philosophy in Biotechnology

COMMUNICATION, LIBERAL ARTS, SOCIAL SCIENCES (CLASS)
Graduate Certificate in Scientific and Professional Communication

DISTANCE EDUCATION

COMPUTER SCIENCE
MS, Doctor of Philosophy

HYDROLOGY
Certificate, MS, PMH, Doctor of Philosophy

CYBERSECURITY
Certificate

MATERIALS ENGINEERING
MS, Doctor of Philosophy

ENGINEERING MANAGEMENT
MEM

MECHANICAL ENGINEERING
ME, MS, Doctor of Philosophy

MASTER OF SCIENCE FOR TEACHERS (MST)

Please note that we accept applications for distance enrollment until approximately two weeks prior to the beginning of the semester. Students who wish to start taking classes but do not have time to complete the application may start taking courses as a special student. Send your special graduate student application to the Center for Graduate Studies at graduate@nmt.edu — please call if you have questions, 575-835-5513.
New Mexico Tech’s hydrology program, established in 1958, is one of the oldest and most highly ranked water resources programs in the United States. Historically, our program has generated about 15% of the PhDs in the USA and has been ranked in the top 5 graduate programs in the country.

Master of Engineering Management (MEM) differs substantially from a conventional MBA program beyond program participants. While the general MBA provides a broad conceptual understanding of the field, the MEM is focused on the theoretical foundations underlying the field, enabling students to better understand the assumptions, rules, and risks associated with making a management decision.

The Master of Science for Teachers (MST) Program was initiated in 1969. More than 400 students have graduated from the program. More than 1000 teachers have taken MST classes as part of their professional development. Most of these teachers received scholarships to cover majority of the tuition and fees. The MST program is ranked 2nd in the country by Graduate School Hub for Master’s Programs offering a low-cost online Science Education (before scholarships). The program was also ranked 9th nationally by Best Value Schools for online degree in Science Education.

Eshani Hettiarachchi, a chemistry graduate student, received the 2019 NMT Langmuir Award for her recently published research on the health implications of inhalable uranium-contaminated dust in the American Chemical Society (ACS) journal, Environmental Science & Technology Letters. The study sheds light on the importance for understanding what effects legacy uranium mines have on nearby Native American populations, aside from exposure to radioactivity.

Cardiovascular and metabolic disease rates remain high among Native American residents near the many abandoned uranium mines in the Grants Mining District in western New Mexico. One explanation could be the exposure to inhalable dust that contains uranium, however, little is known about how depleted uranium interacts with the body inside lungs. Either the dust is harmlessly excreted by the body, or it dissolves into the bloodstream. If it’s the latter case, is it harmful? To find out, we collected dust from five different sites
near the Jackpile and St. Anthony mines within 1.5 miles of a local community. The dust was then characterized to identify its mineral contents, and dissolved in two different fluids meant to simulate two conditions inside human lungs. Then we analyzed the results, looking at the changes of dissolved uranium content when the dust interacts with the simulated lung fluids. Among others, we discovered that uranium could dissolve in the lungs forming a toxic chemical form known as uranyl cation (UO$_2^{2+}$) which then could irreversibly bind to DNA, and the specific mineralogy of the dust has an impact on how the fluids interacted with the uranium.

Overall, we state that the dust inhalation followed by dissolution may cause adverse toxic effects due to the compositional changes (i.e., pH, speciation, and ionic strength) in the lungs. Therefore, understanding the behavior of inhaled Uranium-containing-dust in these mining areas with the specific focus on site mineralogy is vitally important.

The research was conducted at the Environmental Chemistry Laboratory (Dr. Gayan Rubasinghege’s Lab) of New Mexico Tech. Simulated lung fluids were analyzed for uranium using the ICP-MS instrument at the New Mexico Bureau of Geology and Mineral Resources. The research team is Eshani Hettiarachchi (NM Tech), Gayan Rubasinghege (NM Tech), Bonnie Frey (NMBGMR), Daniel Cadol (NM Tech) and Shaylene Paul (Navajo Tech).
Using a unique dataset to detect and locate small magnitude earthquakes off the Oregon coast, along a fault that has long-thought to be minimally active outside of infrequent giant earthquakes. This region, known as the Cascadia subduction zone, has produced giant earthquakes and tsunami, most recently in 1700, but since then has produced very few earthquakes felt on land. Ms. Morton is using data from a recently operated seismic network deployed both on-land and on the sea bottom to test whether this fault zone is truly quiet in between great earthquakes, or if patches of the fault break in smaller earthquakes that are usually undetected when only land-based data is available. Her results suggest that indeed small patches of the fault do produce small earthquakes, with concentrations of these earthquakes occurring where seamounts have previously entered the fault zone.
This paper is significant because magnesium has the potential for use as a bioabsorbable orthopedic implant for screws, pins, plates and stents used in the human body. Currently the magnesium alloys dissolve too fast, or else contain alloying ingredients that are detrimental to the human body. Khalifeh describes a technique for coating the magnesium with a bioabsorbable layer that delays the dissolution long enough for the bones to heal. Once the bones are healed, the magnesium implant dissolves and is eliminated from the body in the urine. This technology eliminates the pain and the cost of the second surgery often used to remove painful screws and plates.

The paper reports on a very significant result - the demonstration of the new graphene based separation materials for chiral liquid chromatography. Currently, the chiral separation materials (so-called stationary phases) are based on silica particles modified with chiral molecules. These materials cannot withstand aggressive solvents and eluents, and are very expensive. At the same time, chiral liquid chromatography is used as a key separation technique, for example, for separation of chiral drugs (more than half of drugs are chiral compounds, and nearly 90% of them are marketed as racemic mixtures). The paper of Lindsay Candelaria reports on the demonstration of stationary phases, which are much more chemically stable than any commercial analogs, and are much cheaper. This is a very significant step forward for liquid chromatography and, to a large extent, for organic chemistry.
HOW TO APPLY

VISIT https://www.nmt.edu/gradstudies/

CONTACT US AT graduate.dept@nmt.edu IF YOU HAVE ANY QUESTIONS

USE THE ONLINE SYSTEM TO START AND SUBMIT YOUR APPLICATION

- Applying for graduate programs in Communication, Education, Mathematics and Science.
  http://gradcas.liaisoncas.org/apply/

- Applying for graduate programs in Engineering
  http://engineeringcas.liaisoncas.org/apply/
GRADUATE STUDENT ASSOCIATION (GSA)

Strong graduate student community. The GSA provides funding for travel, various activities, and holds an annual interdisciplinary symposium.

RESIDENTIAL LIFE

NMT offers a variety of housing options which include dorms, apartments, graduate student housing and family housing.

FINANCIAL ASSISTANCE FOR GRADUATE STUDENTS

The majority of full-time graduate students at New Mexico Tech receive financial aid in the form of assistantships, fellowships, study grants, or part-time employment.