

Fall
2025



Distance Education Courses

August 18, 2025 - December 12, 2025

All times listed are Mountain Time

Center for Graduate Studies



Field campaign to quantify active and orphaned wells in Pawhuska OK, USA. Jonathan Dooley and Prof. Minschwaner setup and perform routine system checks before multiple flights in collaboration with LANL, Sandia National Labs, and the Osage Nation. Dooley earned his PhD in Physics from NMT in Summer 2024. He is also the recipient of NMT's Langmuir award for outstanding research paper. Working with Prof. Ken Minschwaner, Dooley's doctoral research focused on the development and validation of an airborne system to quantify various methane sources.



Cassandra Skaar collecting viral samples at one of her sites in Valles Caldera National Preserve. She earned her MS in Biology in May 2025 and was the recipient of NMT's Founders Award for being outstanding graduate student who has made a significant contribution to the university through scholarship, research, and involvement in campus affairs. Her MS Thesis, titled "Culture-Independent Analysis of Viral Communities in Extremely Acidic Volcanically Influenced Lakes."

ENGINEERING

Chemical*

Civil & Environmental

Computer Science*

Electrical

Engineering Management*

Materials*

Mechanical*

Mineral

Petroleum

Surface Engineering

Surface Engineering

Cyber Electronic
Systems

Explosives Engineering;
Fluid & Thermal Science;
Mechatronics Systems &
Robotics; Solid Mechanics

Intelligent Energetic
Systems

Mineral Exploration;
Geotechnical & Geomech-
anical; Explosives Engineering;

SCIENCE

Biology

Chemistry

Earth & Environmental*

Mathematics

Physics

Geobiology; Geochemistry;
Geology; Geophysics;
Hydrology

Geobiology; Geochemistry;
Geology; Geophysics;
Hydrology

Analysis; Industrial Mathe-
matics; Statistics & Data
Science

Applied & Industrial
Mathematics

Instrumentation

Astrophysics; Atmospheric Physics;
Instrumentation;
Mathematical Physics

Transdisciplinary Biotechnology

Transdisciplinary Cybersecurity*

Science for Teachers*

Public Engagement*

GRADUATE CERTIFICATES:

*Programs offering distance/hybrid education courses
For degree programs that are offered fully via Distance Education please visit:
<https://nmt.edu/gradstudies/DistancePgms.php>

Alternative Licensure - Elementary
Alternative Licensure - Secondary
Cybersecurity*
Electrical Engineering
Explosives Engineering*

Geothermal Engineering* (Pending final HLC approval)
Hydrology*
Scientific & Professional Communication*
Technology Leadership*

+1 575 835 5513

<https://www.nmt.edu/gradstudies/> graduate@nmt.edu



Chemical Engineering



The Department of Chemical Engineering offers coursework and research thesis with an emphasis on surface engineering and industry focused skills. Opportunities to work in close collaboration with national laboratory scientists and in industry funded projects are available. Diverse research areas include: Catalysis & Reactions Engineering; Nanotechnology; Renewable Energy; Biomedical Engineering; Polymer Science; Molecular and Multi-scale Modeling; and Colloidal Science and Interfacial Phenomena.

CH E 5049 - Nanostructures & Nanotech

MWF

11:00-11:50

An introduction to different properties of nanosystems and their applications. Electron transport in nanosystems, optical properties, electrical properties, and magnetic properties. Semiconductor nanostructures and metallic nanostructures, characterization of nanostructures.

CH E 5052 - Surface Character Techniques

TR

09:30-10:45

The course covers scientific principles, instrumentation, and data analysis for several surface characterization techniques for chemical engineering systems. This course also addresses recent research papers regarding their applications. The techniques to be covered include surface topography (profilometers, atomic force microscopy, etc.), spectroscopy (UV-Vis absorption spectroscopy, etc).

CH E 5071 - Modeling in Advanced Materials

TR

11:00-12:15

Overview of several contemporary research topics pertaining to nanomaterials for diverse applications such as energy, environment, electronics, and additive manufacturing. Lectures are focused on general modeling approaches to characterize the nanomaterials, which can have a significant impact on our quality of life. Relevant physical concepts, computational methods, and simulations on parallel computers are also introduced.

Computer Science

```
32 self.fingerprints = set()
33 self.logdups = True
34 self.debug = debug
35 self.logger = logging.getLogger(__name__)
36
37 if path:
38     self.file = open(os.path.join(path, "requests.log"),
39                     "a")
40     self.file.seek(0)
41     self.fingerprints.update(e.request)
42
43 @classmethod
44 def from_settings(cls, settings):
45     debug = settings.getbool("SUPERFILTER_DEBUG")
46     return cls(job_dir(settings), debug)
47
48 def request_seen(self, request):
49     fp = self.request_fingerprint(request)
50     if fp in self.fingerprints:
51         return True
52     self.fingerprints.add(fp)
```

The Department of Computer Science and Engineering is focused on an exciting and rapidly growing body of knowledge with constantly changing emphasis. The curriculum of the department includes courses in both theory and application. It prepares students to apply the principles of logic and mathematics to the design and construction of hardware and software systems using current engineering paradigms and also exposes them to major applications of computing.

CSE 4089 - Foundations of Information Security

T

15:30-18:30

This course will explore the ideas, literature, and worked examples that established the foundations of information security. The course introduces the concept of the Information Domain as the fundamental primitive that is the axis for introducing the policy requirements of Confidentiality, Integrity, and Availability that motivate the need for Information Security.

CSE 5067 - Soft Computing

W

18:00-20:30

Artificial neural networks, with emphasis on multiplayer feedback networks, self-organizing networks, and Hopfield-style networks. Learning algorithms. Introduction to fuzzy systems and evolutionary computing. Engineering applications of soft computing.



Cybersecurity

Addressing many of the greatest challenges to society requires understanding and integrating the methods, theories, techniques, and perspectives of multiple disciplines to develop new approaches to solve complex, real-world challenges. The mission of the Transdisciplinary Cybersecurity graduate programs is to prepare students with a broad understanding of cybersecurity from the foundational documents that have guided the development of the discipline to the ethical, legal, and psychological challenges that cybersecurity professionals face. Students further engage in hands-on cybersecurity risk analysis, data analysis, and policy development.

CYBS 5002 - Cybersecurity Ethics & Law

M

18:00-21:00

A cybersecurity ethics and law course in which students learn standards of professional, ethical behavior in cybersecurity fields by examining case studies, ethical questions, and legal debates from the history of computing and cybersecurity.

CYBS 5005 - Data Science for Cybersecurity

TR

14:00-15:15

Data assembly, exploration, analysis, visualization, and inference. Python libraries such as NumPy, Pandas, and scikit-learn. Students are expected to explore problems related to cybersecurity threats, risks, and incidents that are important for businesses to become safer and less vulnerable to cyberattacks.

CYBS 5014 - Computer Security & Incident Response

M

18:00-21:00

This course covers what computer security incidents are and how to respond to an incident. Computer security incident case studies serve as the backbone of the course allowing students to analyze these case studies and determine how they were handled through process and technical analysis.

CYBS 5041 - Advanced Cryptography

TR

11:00-12:15

This course provides an overview of modern cryptographic theory and techniques, mainly focusing on their application into real systems. Topics include number theory, probability and information theory, computation complexity, symmetric and asymmetric cryptosystems, one-way functions, block and stream ciphers, etc.

CYBS 5061 - Foundations of Cybersecurity

T

15:30-18:30

This course will explore the ideas, literature, and worked examples that established the foundations of information security. The course introduces the concept of the Information Domain as the fundamental primitive that is the axis for introducing the policy requirements of Confidentiality, Integrity and Availability that motivate the need for Information Security.

CYBS 5089 - AI and Cybersecurity

TR

15:30-16:45

This course examines advanced topics at the intersection of artificial intelligence (AI) and cybersecurity.

Earth & Environmental Science



From its founding in the 1950s, the Hydrology Program in the Earth and Environmental Science (E&ES) department at New Mexico Tech has been working across disciplines to answer water questions that impact society and the world. Our focus is on building scientific understanding of fundamental processes that will shape global water sustainability for years in the future, and training students to apply these insights in their careers.

HYDR 5007 - Hydrogeochemistry

TR

11:00-12:15

The thermodynamics and aqueous chemistry of natural waters, with emphasis on groundwater. Chemical equilibrium concepts, surface chemistry, redox reactions, and biochemistry. The interaction of water with the atmosphere and geologic Materials. Basic concepts applied to problems of groundwater quality evolution, water use, and groundwater contamination.

HYDR 5011 - Groundwater Hydrology

TR

12:30-13:45

Study of the occurrence, movement, and chemical and isotopic composition of groundwater. Hydrogeologic properties. Groundwater recharge and stream/aquifer interaction, flow net, and hydrograph analysis. Groundwater exploration using geologic and geophysical methods...

HYDR 5089 - Statistical Methods in Environmental Sciences

W

09:00-09:50

This class explores a set of statistical models useful for solving problems in hydrology and environmental sciences. Topics will include the foundations of Bayesian statistics and Markov Chain Monte Carlo numerical methods, extreme value distributions and environmental risk analysis, Bayesian mixing models, turbulent boundary layers, fluid mechanics, spectral analysis (overview of Fourier and wavelet transforms) as well as applications of machine learning to solving problems in hydrology and environmental science...

HYDR 5093 - Seminar

R

16:00-17:00

Seminar presentations by faculty, students, and outside speakers. Includes both Department and hydrology-specific seminars. Graded on S/U basis. Satisfactory performance consists of regular attendance at approved seminars.

Engineering Management

EMGT 5001 - Management Science for Engineer Management

W

17:00-20:00

This course will expose participants to up-to-date management science applications in engineering and technology organizations. Techniques include linear programming, inventory models, and material requirements planning.

EMGT 5002 - Financial Management

M

17:00-20:00

This course begins with study of the interaction between financial and accounting systems and continues with a discussion of cash flow analysis. This foundation is followed by discussion of the latest in corporate financial management and capital budgeting techniques.

EMGT 5004 - Engineering Statistics

T

17:00-20:00

This course is designed to provide engineering managers with a basic foundation for data-driven decision making. Decisions by modern engineering managers increasingly require a range of statistical skills including gathering and describing data, designing samples and experiments, drawing statistical inferences and conclusions.

Engineering Management Cont.

EMGT 5006 - Managing HR in Technology Organizations R 17:00-20:00

The study of human resource management within technology and engineering organizations at the project, department, and enterprise levels. Leading project teams, managing employee performance and productivity, diagnosing organizational issues.

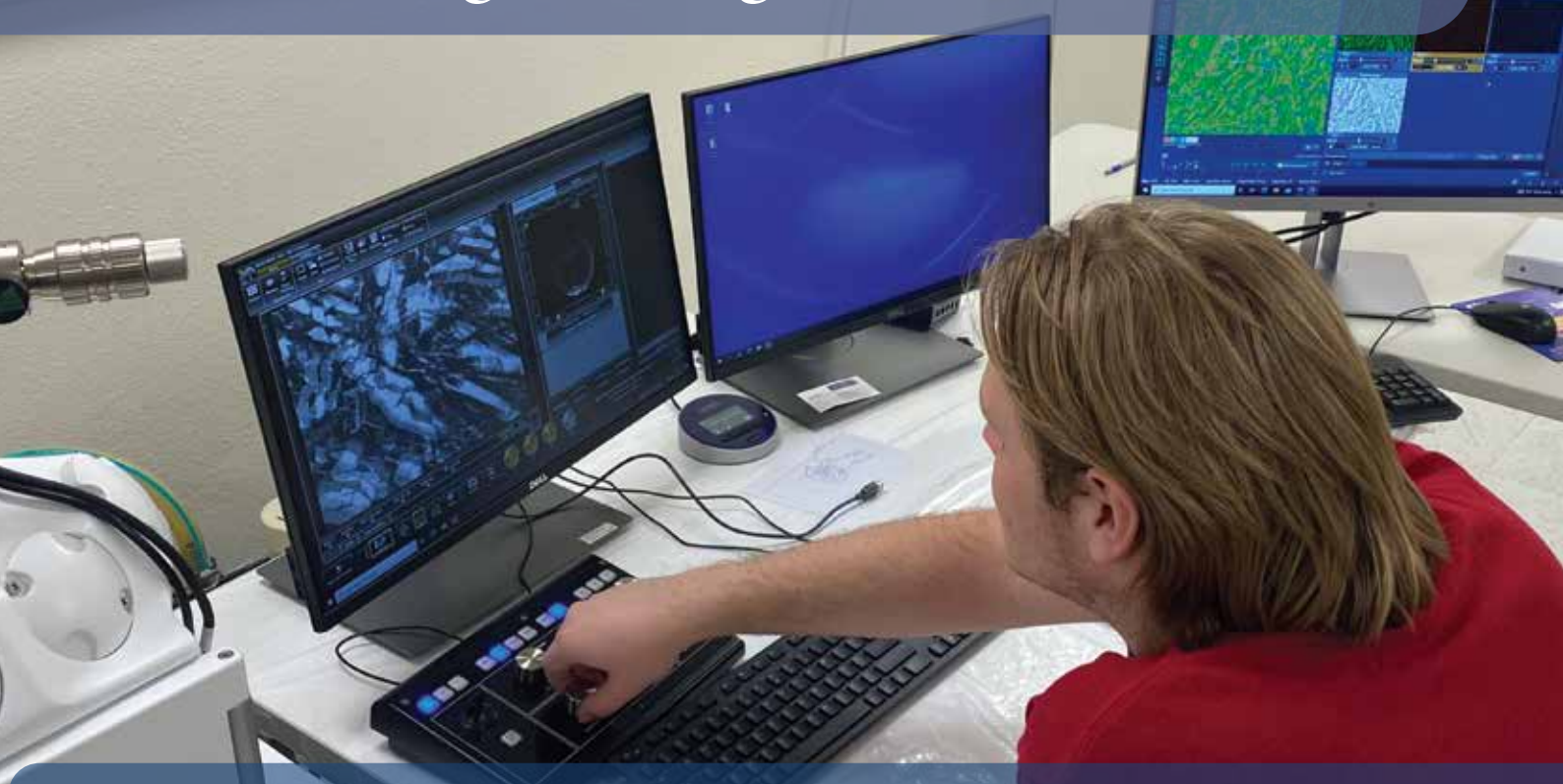
EMGT 5007 - Technology Entrepreneurship M 17:00-20:00

Entrepreneurship is important for new startups and existing companies. This course is focused on development of skills that will assist in the advancement of innovations that will help innovators gain resources to support their efforts. Topics covered include game-theory based negotiation exercises, development of the value proposition for new products and services, and design of the business model in hyper-competitive environments.

EMGT 5089 - Introduction to Space Industry W 17:00-20:00

This course is designed for students interested in the history, law, regulation, and policy of the space industry. Students will learn about the legal frameworks that govern space activities, including treaties such as the Outer Space Treaty and the Moon Agreement, federal acts such as the Commercial Space Launch Act, the National Space Policy, the SPACE Act, and the Artemis Accords.

Materials Engineering



The Department of Materials & Metallurgical Engineering at New Mexico Tech offers MS, ME and PhD Materials Engineering degrees in research areas that include Metals, Ceramics, Polymers, Soft Matter, Biomaterials, Energetic Materials, Computational Materials Science, Additive Manufacturing, and Nano/Quantum Materials.

MTLS 5020 - Biomedical Materials

TR

15:30-16:45

This course covers the application of Materials in medical devices. Mechanical properties of hard and soft tissues are reviewed. Applications of biomaterials in orthopedics are discussed with emphasis on problems of material-tissue interactions.

MTLS 5080 - Dislocation Theory

MWF

10:00-10:50

Dislocations in isotropic continua; effects of dislocations on crystal structure; point defects and physical properties; point defects and mechanical properties; dislocation-point-defect interactions and groups of dislocations; dislocation interactions.

MTLS 4083 - Scanning Electron Microscopy

MWF

09:00-09:50

Fundamental theory and experimental techniques in scanning electron microscopy. Electron optics, electron beam interactions with solids, signal detection and processing. Chemical X-ray microanalysis.

Mechanical Engineering



AE 3013 - Orbital Mechanics

TR

08:00-09:15

This is a first upper-division course covering the Newtonian mechanics of orbits. Applications include ballistic missiles, satellites, and lunar and interplanetary orbits.

MENG 5004 - Advanced Mechanics of Materials

TR

14:00-15:15

Development of advanced mechanics of materials principles and techniques for use in engineering design and problem solving. Topics include material yielding; torsion; unsymmetrical bending of beams; shear stresses in thin-walled structures, etc.

MENG 5017 - Advanced Finite Element Analysis

TR

14:00-15:15

An introduction to the numerical analysis calculus of variation, weak form of a differential equation, weighted residual techniques, solution of one-dimensional problems by the finite element method, bending problems, Lagrange and Hermite interpolation functions, etc.

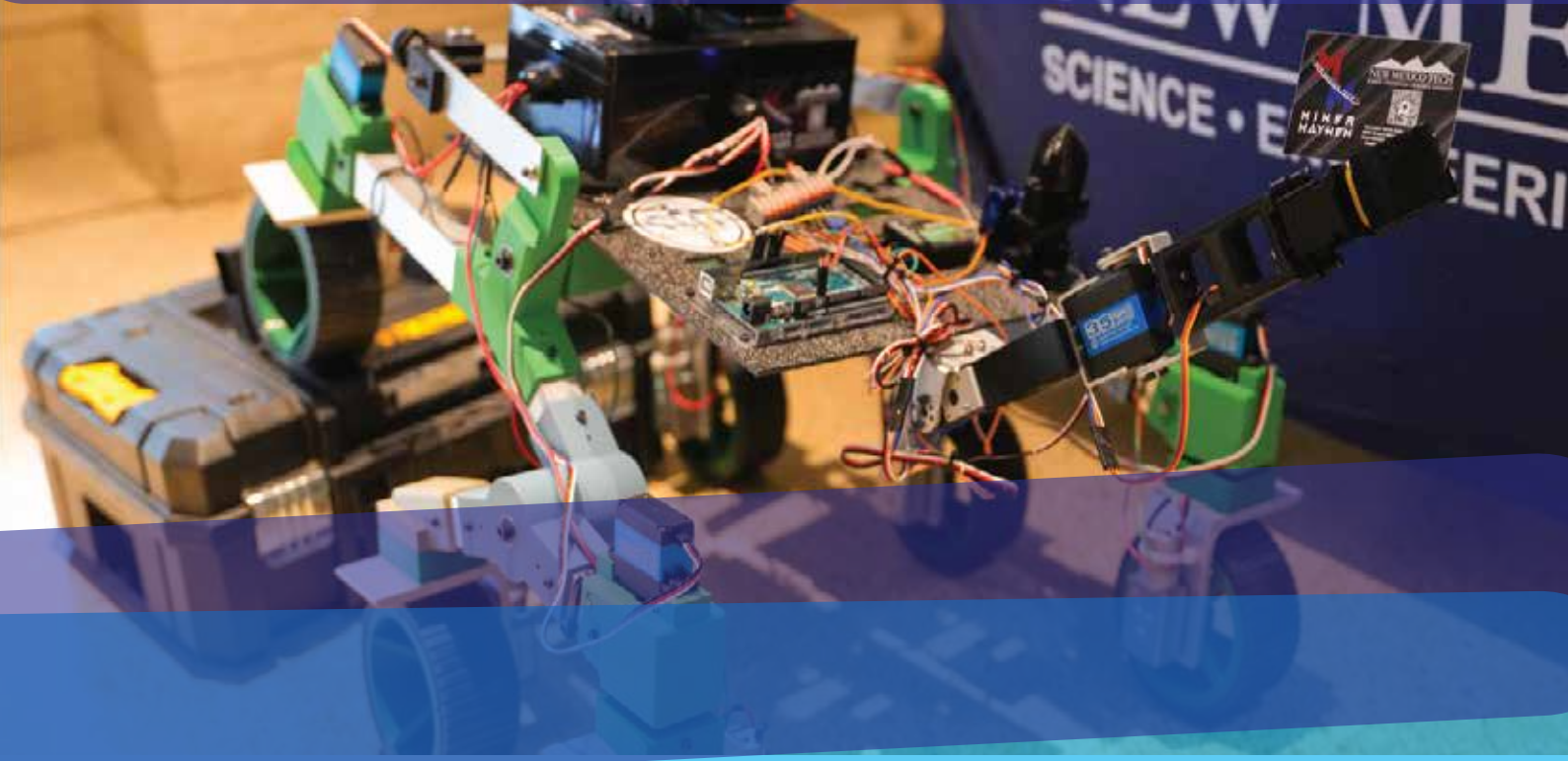
MENG 5020 - Fracture Mechanics

TR

08:00-09:15

An introduction to the theory of elasticity, singular stress fields, Westergaard method, complex variable technique, stress intensity factor, fracture energy, numerical and experimental methods in determination of stress intensity factor, fracture toughness, and J-integral Elastoplastic fracture.

Mechanical Engineering Cont.



MENG 5043 - Control System Design

TR

12:30-13:15

This course provides an introduction to the analysis and design of advanced control systems. The frequency domain analysis, root locus analysis, design process, and PID controller and compensator design will be emphasized. Fundamental limitations of feedback will be discussed and advanced PID design techniques will be presented.

MENG 5045 - Introduction to Explosives Engineering

TR

09:30-10:45

Introduction to the broad field of explosives science and technology. Topics covered include basic organic chemistry, decomposition reactions, properties of explosives, thermodynamics of explosives, shock wave theory, detonation theory, initiators, Gurney equations, blast effects, and demolition.

MENG 5046 - Detonation Theory

F

11:00-13:30

Development of classical detonation model for full order detonation of secondary explosives. Ideal versus non-ideal detonation. Burn-rate models for pyrotechnics. Derivation and application of the Mie-Gruneisen equation of state. The concept of deflagration to detonation transition.

MENG 5052 - Explosives Technology & Applications

F

08:00-10:30

Focus on the application of explosives mechanics. Fundamentals of explosive welding/cutting, shaped charges, explosive-driven flux compression generators, spallation's, explosives initiation methods, explosives applied testing methods, etc.

MENG 5061 - Digital Image Processing

TR

11:00-12:15

This class will provide an introduction to digital image processing, beginning with a discussion of imaging systems and storage of digital images then progressing to image filtering.

Mechanical Engineering Cont.



MENG 5063 - Bioinspiration & Biomimetrics

TR

09:30-10:45

This course discusses the knowledge learned and inspired by nature and biological systems to solve concrete engineering problems. Topics including bioinspired drag reductions techniques, locomotion, navigation.

MENG 5075 - Advanced Engineering Math

TR

08:00-09:15

A comprehensive study of applied mathematics. Vector analysis, tensors and Eigenvalue problems. Analytical solutions to linear ordinary and partial differential equations. Separation of variables, boundary value problems, and Laplace and Fourier transforms.

MENG 5080 - Comp Fluid Dynamics & React Flow

TR

12:30-13:15

Introduction to Computational Fluid Dynamics and application of CFD tools to thermal and fluid flow problems. Coupling of fluid flow with combustion chemistry. Discussion of combustion modeling, importance of the mixing intensity, heterogeneous and homogeneous chemical reactions, and application of computer analysis to chemically reacting flow problems.

MENG 5085 - Graduate Faculty Seminar

M

11:00-11:50

This class is designed to cover a wide range of topics in engineering and science by invited speakers. The department invites external/internal speakers each week providing a chance for our students to be exposed to topics in various subjects.

Mineral Engineering

ME 5089 - Machine Learning Apps in Geosci & Eng

MW

13:00-14:15

This course offers a comprehensive introduction to applying machine learning techniques in geoscience and engineering. Through a combination of theoretical instruction and hands-on projects, students will gain practical experience in building, implementing, and evaluating machine learning models to address real-world challenges in these domains. Students will develop a strong foundation in core machine learning concepts and statistical methods, alongside data preprocessing and model evaluation techniques.

Petroleum Engineering

PETR 5046 - Advanced Formation Evaluation

TR

17:00-18:15

Study of physical and textural properties of reservoir rocks which provide a link between reservoir engineering and well logging. Advanced exploration and production logging. Estimation of geological environment.

PETR 5067 - Thermal Recovery

MW

10:30-11:45

This course offers an in-depth examination of thermal recovery methods applied to geothermal systems. It covers the principles of geothermal heat transfer mechanisms, and operational strategies for sustainable production.

Public Engagement



The MS in Public Engagement in Science, Design and Communication teaches students to research, critically analyze and communicate information and technology to diverse communities.

PCOM 5003 - Applied Research Methods

TR

15:30-16:45

Project-based seminar guides students to learn methods in quantitative, qualitative, mixed methods, and user experience research.

PCOM 5006 - Communication, Product, and Experience Design

MW

17:00-18:50

This course teaches students the principles and practices of experience and information design. Students examine design case studies. They develop and test research-based multidisciplinary, iterative design projects.

PCOM 5061 - Storytelling with Data

TR

12:30-13:45

How to communicate effectively using data. Learn how to add meaning to scientific and descriptive data in graphics, persuasive text and mixed media presentations.

POLS 5070 - Policy Science

M

14:00-15:15

Reviews a worldwide policy movement emerging in response to the increasingly complex problems of the decision in the modern era. In the United States, the movement takes various institutional forms, including think tanks, offices of planning and evaluation, and university-based programs in public policy.

TCOM 5089 - Advanced Grant Writing

TR

17:00-18:15

The purpose of this course is to build grant writing skills through reading, discussion of drafts and practice writing and revising grants. This course will specifically help you learn to better reach out to funding organizations and learn what data can be most persuasive to funding organizations. This course also involves study and analysis of successful grants.

Non-Degree Seeking



Degree Seeking



Online and/or in person
\$1,375 + fees
per semester for
3 credits

If you are interested in taking classes, but are not intending to pursue a graduate degree or you are taking courses to prepare for a degree, you may be admitted as a Non-Degree Seeking Graduate student.

Individuals seeking Non-Degree Graduate (pre-degree) status must already have earned a bachelors degree.

<https://www.nmt.edu/gradstudies/> graduate@nmt.edu +1 575 835 5513

Main website



New Mexico Tech's History

