

COMPANIES WHO EMPLOY OUR GRADS

ADNOC
Anadarko
Aramco
Albemarle
Argonne National Laboratory
Baker Hughes
Bettis Atomic Power Laboratory
Bloomenergy
BP
Charles River Associates
Chesapeake
Chevron
China University of Petroleum
CMG Oil & Gas
Compass Minerals
ConocoPhillips
Consol Energy
Cummins
Dalian University of Technology
Devon
Dong-A University, Korea
Ehime University, Japan
Environment Canada
Equitable
ExxonMobil
Ford Corporation

FuelCell Energy
Golder Associates
Halliburton
Hess
Inpetro Energy
IHRDC
Intel
Johnson Matthey
Kuwait Oil Company
Lehigh Hanson
Marathon
Monitoring Analytics
National Energy
Technology Laboratory
National Fuel Gas
National Renewable
Energy Laboratory
New York Independent
System Operator
Newfield
Newmont Mining Corporation
Noble Energy
PJM Interconnection
Petramina
Petroleum Development Oman
Petronas

PTT Thailand
Qatar Oil and Gas
Range Resources
Sasol
Schlumberger
Seneca Resources
Shell
South China University
of Technology
Stanford
Turkish Petroleum Company
U.S. Department of Energy
U.S. National Institute for
Occupational Safety and Health
University of Kentucky
University of Texas at Austin
University of Texas Bureau
of Economic Geology
University of Utah
USGS
Virginia Polytechnic Institute and
State University
Wuhan University of Science and
Technology, Wuhan, China
XTO Energy



Inspired Research.
Innovative Education.
Interdisciplinary Programs.



HOW TO APPLY:

Our application process is online, including the submission of all documents in support of your application. Admission into M.S. and Ph.D. degrees in Energy and Mineral Engineering (EME) is based on undergraduate performance, a statement of purpose, letters of recommendation, standardized test scores, and number of spaces available for new students. To learn more about Penn State's Graduate School and our application process for graduate studies in EME, including funding opportunities and deadlines, please visit us at:

www.eme.psu.edu/emegrad/apply

Completed applications with all required documentation must be submitted before the deadlines. **Apply early!**

For more information contact:

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PennState
College of Earth
and Mineral Sciences

John and Willie Leone Family
**Department of Energy and
Mineral Engineering**



OVERVIEW

The John and Willie Leone Family Department of Energy and Mineral Engineering (EME) is a unique department with world-class faculty experts in science, engineering, economics, and statistics as applied to the energy and mineral resources sector. In contrast to traditional disciplinary departments, EME faculty encompass the range of disciplines required for the energy and environmental challenges of today and for the next century. Research and graduate education includes strength in petroleum engineering and reservoir characterization, electricity market design, grid integration of diverse fuels and technologies, mining engineering and mineral processing, fuel chemistry and processing, energy conversion engineering, environmental safety and health-related issues associated with the energy and mineral resource sector, among many others. Methodologies span experimental laboratory science, computational modeling and simulation, and advanced data analytics.

WHY EME @ PENN STATE?

The graduate program in EME reflects this diversity by providing a flexible program for M.S. and Ph.D. degrees that facilitates the specialization in one area allowing our students to become leading-edge researchers while at the same time developing the complementary breadth across scientific disciplines and engineering technologies necessary to become a next generation leader in academia or industry.

Graduate research and education utilizes our many state-of-the-art research labs, and characterization and computational facilities. Research programs and projects are generally supported by centers and institutes at Penn State, including the EMS Energy Institute, the Earth and Environmental Systems Institute, the Institutes for Energy and the Environment, and Institute for Natural Gas Research (INGaR). Many faculty are affiliated with and collaborate closely with other departments across Penn State, such as Chemical Engineering, the Harold and Inge Marcus Department of Industrial and Manufacturing Engineering, Geosciences, Statistics, and Agricultural and Environmental Resource Economics.

If you are looking for a graduate education grounded in rigorous science, engineering, and economics, not limited by historical boundaries around disciplines, and want to emerge as a leader equipped with tools and skills to tackle big energy and resource challenges in the 21st Century, the EME graduate program may be the place for you.

www.eme.psu.edu/emegrad/apply



RESEARCH FOCUS AREAS



ENERGY SCIENCE & ENGINEERING

fuel science, advanced conversion methods, carbon capture, solar ecology, materials for energy electrochemistry conversion, fuel cells and batteries, solar systems engineering, biofuels, catalysis

Faculty in this area apply experimental and modeling tools in science and engineering to develop next generation sustainable clean power technologies for fuel processing, efficient and environmentally friendly energy conversion, energy storage, and power production. Examples include research in fuel chemistry, advanced combustion processes like chemical looping combustion and pressurized oxy-fuel combustion, catalytic conversion, carbon capture technologies, materials science for energy applications, electrochemical storage of energy, biofuels, and integration of solar and photovoltaic energy at scale.

Key Faculty: Brownson, Eser, Lvov, Mathews, Pisupati, Radovic, Razaee, Song, Vander Wal, Webster



ENERGY SYSTEMS ENGINEERING & ENERGY ECONOMICS

electricity and natural gas markets, grid optimization and simulation

Faculty engaged in this research area apply economics, operations research, and engineering to market design and system design and operations. Examples include electricity market design, economics of technological innovation, planning robust, sustainable, and resilient energy infrastructures under uncertainty, integration of electricity and natural gas systems and markets, and economics of environmental regulations on energy systems.

Key Faculty: Ayala, Blumsack, Brownson, Karamalidis, King, Kleit, Landry, Lei, Lo Prete, Srinivasan, Webster



MINING, INDUSTRIAL SAFETY & HEALTH, AND GEOENVIRONMENTAL ENGINEERING

ground control, ventilation, dynamic optimization of production systems, mine electrical systems, occupational safety & health systems, exposure assessment, risk characterization & mitigation, regulatory & minerals policy analysis, coal preparation, mineral processing, rare earth extraction from secondary sources, environmental management, pollution control, waste management and environmental sustainability

Faculty engaged in this research apply science and engineering principles to develop sustainable methods and processes to extract and beneficiate mineral resources in a safe, economic, and environmentally responsible manner; and to the identification, characterization, and mitigation of risks to safety and health that arise from extraction, beneficiation, and use of mineral and energy-related resources. This research spans the full life cycle of the mineral industries, and includes analysis of the effectiveness of regulatory policies on safety and health, as well as on the economic affects of policy on the development of mineral resources.

Key Faculty: Bhattacharyya, Elsworth, Gernand, Groves, Karamalidis, Klima, Kleit, Kohler, Liu, Landry, Pisupati, Rezaee, M. Wang



PETROLEUM/GAS & SUBSURFACE ENGINEERING

unconventional production, stimulation, reservoir characterization and simulation, digital rock physics, multiphase flow & transport phenomena in porous media, subsurface coupled processes

Faculty engaged in this area apply science and engineering concepts to advance cutting-edge research and technologies for the efficient recovery of hydrocarbons and other earth fluids from complex natural systems. This entails the use of techniques for the description, study, and high performance computation of complex subsurface processes. Examples include the study of field-scale characterization, seismic data integration, rock and fluid interactions, hydraulic fracturing design and evaluation, surface production design, recovery from unconventional resources including tight sands, shales, coal bed methane, hydrates and bituminous oil reservoirs, enhanced recovery processes, groundwater remediation, geothermal energy extraction, and sequestration of carbon dioxide and other greenhouse gases.

Key Faculty: Ayala, Dahi, Elsworth, Emami, Johns, Karamalidis, Karpyn, King, Liu, Lvov, Mathews, Mehrabian, Morgan, J. Wang, Srinivasan