HAROLD VANCE DEPARTMENT OF PETROLEUM ENGINEERING

Department Head: Thomas A. Blasingame

Director, Graduate Programs: Eduardo Gildin

Known as the leader in the petroleum industry, the Harold Vance Department of Petroleum Engineering is consistently ranked one of the top graduate programs in petroleum engineering by U.S. News and World Report. Graduate degree programs include the Doctor of Philosophy, the Master of Science (thesis-based), and the Master of Engineering (non-thesis); all degrees are available both on-campus and online.

The faculty in the graduate program in Petroleum Engineering conducts transformative research by converging scientific advances with technology ideation and maturation. Our approach spans experimentation, theory, and large-scale application in operational systems.

Examples of energy systems within our expertise are:

1. Oil and gas exploration, evaluation, production, and optimization,
2. Carbon Capture, Utilization, and Storage (CCUS),
3. Hydrogen storage and natural hydrogen systems,
4. Extraction of critical minerals (e.g., lithium, uranium, cobalt),
5. Geothermal energy, and
6. Chemical, mechanical, or heat energy storage and transfer in the subsurface.

Our faculty are pioneering technological innovations that serve several components of the traditional petroleum engineering and Energy Transition systems, including:

1. Reservoir Characterization and Management – Integrated studies of reservoir properties, fluids, geomechanics, and production optimization.
2. Analytical, Numerical, and Data-Driven Modeling – Advanced simulations for reservoir performance, production forecasting, and uncertainty assessment.
3. Enhanced and Improved Oil Recovery (EOR/IOR) – Chemical, thermal, and gas injection techniques for maximizing hydrocarbon recovery.
4. Artificial Lift, Flow Assurance, and Production Optimization – Techniques for efficient well performance and sustained hydrocarbon flow.
5. Drilling, Well Completions, and Stimulation – Physics-based drilling, hydraulic fracturing, well control, and abandonment strategies.
6. Carbon Capture, Utilization, and Storage (CCUS) & Energy Transition – Geothermal, hydrogen storage, decarbonization, and critical minerals.
7. Petrophysics and Multiphase Flow in Porous Media – Formation evaluation, fluid behavior, and reservoir engineering applications.
8. Machine Learning and Data Analytics – Applications in sensor validation, reservoir modeling, inverse modeling, and production forecasting.
9. Surface Facilities, Waste Management, and Leak Detection – Infrastructure integrity, produced water treatment, and environmental impact mitigation.
10. Geomechanics and Wellbore Stability – Theoretical, experimental, and applied research on stress, rock behavior, and fracture mechanics.,

Our faculty conduct research on the complex physical dynamics occurring in natural rock formations and geo-inspired materials. These processes involve the coupling of multiple phenomena including thermal, hydraulic, mechanical, and chemical interactions across varying spatial and temporal scales. In addition to experimental investigations, our work includes the development of theoretical models that facilitate scale bridging and enable the translation of first-order effects to field-scale applications.

Students are mentored by internationally acclaimed faculty, including National Academy of Engineering members and numerous SPE award recipients. Details concerning the faculty, current research projects, and technology specialties can be found at our website http://engineering.tamu.edu/petroleum/

Faculty

Abedi, Sara, Associate Professor
Petroleum Engineering
PHD, University of Southern California, 2012

Akkutlu, I. Yucel, Professor
Petroleum Engineering
PHD, University of Southern California, 2002

Al-Mohannadi, Nasser Saqer L H, Professor of the Practice
Petroleum Engineering-Qatar Campus
PHD, Colorado School of Mines, 2004

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PHD, Texas A&M University, 2021

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PHD, Texas A&M University, 1997

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PHD, Georgia Institute of Technology, 2018

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Lee, W. John, Professor
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PHD, Georgia Institute of Technology, 1963

Maggard, Bryan, Senior Lecturer
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Samouei, Hamidreza, Research Assistant Professor
Petroleum Engineering
PHD, Shiraz Univeristy, 2011

Seers, Thomas D, Associate Professor
Petroleum Engineering-Qatar Campus
PHD, University of Manchester, 2016

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PHD, University of Texas, 2016

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PHD, Mining University of Leoben, Austria, 1996

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MS, Texas A&M University, 1992

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PHD, The University of Texas at Austin, 1992

Masters

- Master of Engineering in Petroleum Engineering (https://catalog.tamu.edu/graduate/colleges-schools-interdisciplinary/engineering/petroleum/meng/)
- Master of Science in Petroleum Engineering (https://catalog.tamu.edu/graduate/colleges-schools-interdisciplinary/engineering/petroleum/ms/)

Doctoral

- Doctor of Philosophy in Petroleum Engineering (https://catalog.tamu.edu/graduate/colleges-schools-interdisciplinary/engineering/petroleum/phd/)