

Petroleum and Geosystems Engineering

*Master of Science in Engineering
Doctor of Philosophy*

For More Information

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Objectives

This program is designed to educate engineers to develop technology and solve problems related to earth energy resources. Student research has traditionally focused on oil and gas, but sustainability topics are growing in importance in the curriculum and as research endeavors. Once students have chosen a degree option, they may choose to work closely with a faculty member conducting research in their area of interest. The program offers a doctoral degree based on a combination of coursework and research, and a master's degree based on either a thesis or a report, or on coursework alone.

Hildebrand Department faculty are leaders in technology for the development of unconventional oil and gas, mentoring students to advance technology in drilling techniques, hydraulic fracturing, reservoir characterization and improved recovery, working to maximize the value of every well drilled for the abundant shale plays in the United States and around the world. Our researchers also work on ways to better utilize legacy oil and gas plays, devising new Enhanced Oil Recovery (EOR) methods to better extract the last drop of oil from discovered fields. We also recognize that, given the world currently depends on fossil fuels for 80% of its energy, and in the United States we depend on oil and gas for 70% of our energy, it is crucial that we innovate in ways to make those energy sources more sustainable. New programs in methane emissions monitoring and mitigation given students opportunities to be part of the solution for a lower carbon future. Research in carbon capture and storage (removing CO₂ from the atmosphere and storing it in underground aquifers and depleted reservoirs) are innovations from petroleum engineering that will also address reducing CO₂ impacts on climate. Program faculty are engaged in low carbon energy technologies such as geothermal energy, hydrogen, and rare earth metals supply, which are innovations that build on the foundation of petroleum engineering knowledge base and provide students with a broad and resilient experience that will lead to a rewarding career.

Facilities for Graduate Work

Excellent facilities for graduate research in petroleum and geosystems engineering are available in multiple engineering buildings where Hildebrand Department faculty, staff and students work. The Chemical and Petroleum Engineering Building is home to the department offices, classrooms, student office and study space, and state of the art research laboratories. Another segment of the program's research staff occupy

the Gary L. Thomas Energy Engineering Building, an interdisciplinary education and research building dedicated to solving the problems for our energy future. Finally, additional laboratory space at the J. J. Pickle Research Campus is used for large scale research apparatus. A machine shop is maintained to fabricate and support research equipment.

In addition to the facilities of Information Technology Services, students have access to a host of computers housed in the Hildebrand Department of Petroleum and Geosystems Engineering, including numerous PCs, workstations, and parallel computing clusters. World-class supercomputing facilities are also available at the Texas Advanced Computing Center. Excellent library facilities include the Mallet Chemistry Library, the Walter Geology Library, and the Kuehne Physics Mathematics Astronomy Library.

Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee (GSC) in the spring 2023 semester.

Matthew Thomas Balhoff	Quoc Phuc Nguyen
Hugh C Daigle	Ryosuke Okuno
Mojdeh Delshad	Jon E Olson
David DiCarlo	Masa Prodanovic
David N Espinoza	Michael Pycrz
John Timothy Foster	Arvind P Ravikumar
Kenneth E Gray	Kamy Sepehrnoori
Zoya Heidari	Mukul M Sharma
Larry W Lake	Wen Song
Silviu Livescu	Carlos Torres-Verdin
Yingda Lu	Eric van Oort
Kishore Mohanty	Mary F Wheeler

Admission Requirements

All prospective degree candidates must have a background satisfactory for study of advanced petroleum and geosystems engineering as determined by the Graduate Studies Committee. For students without this background, such as those without degrees in engineering or in the petroleum-related fields, the Graduate Studies Committee will recommend a program of coursework designed to prepare the student for graduate study. Complete requirements for admission are available [online](#).