Geosystems Engineering Approved Technical Electives

2024-2026 Catalog

Geosystems Engineering: 12 hours of technical electives (4 courses) are required, nominally two from engineering (Section I) and two from geoscience (Section II). However, one course is allowed from Section III, which could substitute to count for either one Section I or Section II course (student's choice).

SECTION I, Engineering (At least 2 courses must be taken):

E S 369N	Sustainability Issues in Energy **(F)**
PGE 323L	Reservoir Engineering II: Secondary and Tertiary Recovery **(S)**
PGE 323M	Reservoir Engineering III: Numerical Simulation **(F)**
PGE 338	Geostatistics and Data Analysis **(F,S)**
PGE 362	Production Technology and Design (S)
PGE 364	Natural Gas Engineering **(F)**
PGE 376	*Special Problems in Petroleum/Geosystems Engineering* **(F, S, SU)**
PGE 379	Advances in Unconventional Shale Gas Resources[5]
PGE 379	Formation Evaluation of Unconventional Reservoirs[5]
PGE 379	Subsurface Energy Storage **(F)**
PGE 379	Unconventional Resources Development[5] **(F, S)**
PGE 379.3	Geothermal and Sustainable Energy Resources[1] **(S)**
PGE 379.4	Carbon Capture and Storage **(F)**
PGE 379.5	Energy and the Environment **(F)**
PGE 379.9	Subsurface Machine Learning[2] **(F)**
PGE 379.13	Fundamentals of Enhanced Oil Recovery Techniques **(S)**
PGE 379.14	High Performance Computational Engineering[3] **(S)**
PGE 379.16	Hydraulic Fracture Design and Evaluation **(F)**
PGE 379.17	Applied Subsurface Geology **(S)**
PGE 379.19	Advanced Well Construction
PGE 379.22	Global Carbon Monitoring Systems **(S)**
PGE 679HA	*Undergraduate Honors Thesis, must be in honors program*
PGE 679HB	*Undergraduate Honors Thesis, must be in honors program*

Some PGE graduate courses may be taken as technical electives. Students are required to have approval to take a graduate course for undergraduate credit. The application is found at https://students.engr.utexas.edu/policies-forms, select: Undergraduates Taking Graduate Courses.

SECTION II, Geosciences (At least 2 courses must be taken):

GEO 320S	Introduction to Atmospheric Sciences
GEO 325K	Computational Methods[3]
GEO 325M	Numerical Modeling[3]
GEO 327G	GIS and GPS Applications in Earth Science
GEO 328W	Vadose Zone Hydrology
GEO 428	Structural Geology
GEO 330K	Energy Exploration **(S)**
GEO 338J	Marine Geology
GEO 341	Mineral Resources, Society and Environment
GEO 346C	Introduction to Physical and Chemical Hydrology **(F, S)**
GEO 347D	Global Warming (S)
GEO 347G	Climate System Modeling
GEO 455S	Introduction to Remote Sensing for Geoscientists
GEO 660A	Field Geology[4]
GEO 365Q	Geomorphology: Landscape Process and Form
GEO 468K	Geophysics for Geological Sciences Majors **(S)**
GEO 370E	Ecohydrology and Biometeorology
GEO 371C	Glaciology
GEO 371T	Climate Systems Physics
GEO 371T	Fundamentals of Geothermal Energy Systems

SECTION II, Geosciences (cont.):

GEO 371T	Intro to Machine Learning[2]
GEO 371T	Climate Change Mitigation
GEO 371T	CO2 Injection and Storage in Geologic Formations
GEO 371T	Fundamentals of Geothermal Energy Systems[1]
GEO 376L	Field Methods in Groundwater Hydrology **(SU)**
GEO 376S	Physical Hydrology **(F)**
GEO 377K	Applied Karst Hydrology **(F)**

SECTION III, Optional (Only 1 course may be taken to count for either one Section I or II course):

M 340L	Matrices and Matrix Calculations **(F, S, SU)**
M 341	Linear Algebra and Matrix Theory **(F, S)**
M 346	Applied Linear Algebra **(F, S)**
M 348	Scientific Computation in Numerical Analysis[3] **(F, S)**
M 368K	Numerical Methods for Applications[3] **(S)**
M 427L	Advanced Calculus for Applications II **(F, S, SU)**
NSC 325	Inventors Program: Energy (only when taught by PGE faculty member)
C E 370K	Environmental Sampling and Analysis **(F, S)**
C S 323E	Elements of Scientific Computing **(F,S)**
C S 367	Numerical Methods
GEO 371T	Energy, Technology and Policy
PGE 379.8	Oil, Gas and Mineral Law[1] **(S)**
PGE 363	Petroleum Land Leasing Regulations & Practices[2] **(S)**
PGE 371	Energy Finance[2] **(S)**
CHE 359	Energy Technology and Policy **(F, S)**
FIN 320F	Foundations of Finance **(F, S, SU)**
I B 320F	Foundations of International Business **(F, S, SU)**
LEB 320F	Foundations of Business Law and Ethics **(F, S, SU)**
MAN 320F	Foundations of Management and Organizational Behavior **(F, S, SU)**
M E 363M	Energy Technology and Policy **(S)**

FOOTNOTES

[1] Only one introductory geothermal topic course may be counted toward degree requirements.
[2] Only one machine learning topic course may be counted toward degree requirements.
[3] Only one advanced computing methods topic course may be counted toward degree requirements.
[4] Will only count as one course toward degree requirements.
[5] Only one unconventional resources topic course may be counted toward degree requirements.

WHEN COURSES ARE OFFERED

Courses regularly taught in specific semesters are indicated with the following codes in parentheses:
F – Fall
S – Spring
SU – Summer

This is not an official degree audit. Please contact a Hildebrand Department of Petroleum and Geosystems Engineering academic advisor for advising.