

PETROLEUM ENGINEERING (PETE)

PETE 4303 Petroleum Rock and Fluids

Prerequisites: CHEM 1314 or CHEM 1414; MATH 2144 or MATH 2123; PHYS 2014 or PHYS 1114; ENSC 3233 or MET 3313. Co-requisite(s): GEOL 3413 or GEOL 4023.

Description: Topics include rock properties, flow through porous media, principles of organic chemistry; properties of hydrocarbon liquids and gases; multicomponent mixtures; phase behavior; and gas-liquid equilibrium concepts. Previously offered as ENGR 4303.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Undergraduate

Schedule types: Lecture

Department/School: Chemical Engineering

PETE 4313 Drilling and Well Completions

Prerequisites: GEOL 3413; ENSC 3233 or MET 3313.

Description: Topics include drilling systems; drilling fluids, drilling hydraulics, cuttings transport, drill bits, oilfield pipe, cements and cementing operations, perforating, acidizing, hydraulic fracturing, and oilfield tools. Previously offered as ENGR 4313.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate, Undergraduate

Schedule types: Lecture

Department/School: Chemical Engineering

PETE 4333 Production Engineering

Prerequisites: PETE 4303; ENSC 3233 or MET 3313.

Description: Topics include a review of artificial lift technologies, multi-phase flow, well stimulation, facilities engineering, gas treating, troubleshooting well production, advanced production strategies, industrial special topics and production equipment selection. Previously offered as ENGR 4333.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate, Undergraduate

Schedule types: Lecture

Department/School: Chemical Engineering

PETE 4343 Reservoir Engineering and Well Testing

Prerequisites: PETE 4303.

Description: Topics include reservoir fluid flow, well performance, gas and water coning, water influx, oil recovery mechanisms, oil and gas reservoirs, water flooding, type curve matching, well testing, and buildup and drawdown tests. Previously offered as ENGR 4343.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Undergraduate

Schedule types: Lecture

Department/School: Chemical Engineering

PETE 4990 Special Problems in Petroleum Engineering

Prerequisites: Consent of instructor.

Description: Independent study on specific topics in drilling, production and reservoir engineering.

Credit hours: 1-5

Contact hours: Lecture: 1

Levels: Undergraduate

Schedule types: Lecture

Department/School: Chemical Engineering

PETE 5000 Master's Thesis

Prerequisites: Consent of major professor.

Description: Research and thesis writing. Offered for variable credit, 1-6 credit hours, maximum of 6 credit hours.

Credit hours: 1-6

Contact hours: Lecture: 1

Levels: Graduate

Schedule types: Lecture

Department/School: Chemical Engineering

PETE 5110 Special Topics in Petroleum Engineering

Prerequisites: Graduate standing and consent of instructor.

Description: Specialized course addressing specific topics in drilling, production, or reservoir engineering. May be repeated for credit if subject matter varies. Offered for variable credit, 1-3 credit hours, maximum of 6 credit hours.

Credit hours: 1-3

Contact hours: Lecture: 1

Levels: Graduate

Schedule types: Lecture

Department/School: Chemical Engineering

PETE 5303 Petroleum Geomechanics

Prerequisites: PETE 4303 or consent of instructor.

Description: Fundamentals of deformation and failure of sedimentary rocks; application of geomechanics in wellbore stability, solids productions, hydraulic fracturing and reservoir geomechanics.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Chemical Engineering

PETE 5313 Advanced Drilling Modeling and Simulation

Prerequisites: PETE 4313 or consent of instructor.

Description: Advanced coverage of petroleum drilling operations with an emphasis on real-time drilling optimization; rate of penetration (ROP) modeling and simulation; drilling hydraulics with fluid design optimization; use of a simulator to predict ROP for different drills bits through different formations. Previously offered as ENGR 5323.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Chemical Engineering

PETE 5333 Advanced Production and Flow Assurance

Prerequisites: PETE 4333 or consent of instructor.

Description: This course covers petroleum production systems and methods used to assure flow through the system. Topics include downhole and surface equipment, transport through pipelines, inflow performance, phase behavior in oilfield equipment, downhole and surface separation, field treating of natural gas, and production enhancement.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Chemical Engineering

PETE 5343 Advanced Reservoir Engineering

Prerequisites: PETE 4343 or consent of instructor.

Description: Topics include reservoir drive mechanisms, material balance approach to predict oil and gas reservoir properties, fluid flow in porous media, principles of secondary and tertiary recovery methods, analytical and numerical solutions for fluid flow in reservoirs, and well test analysis.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Chemical Engineering

PETE 5363 Petroleum Economics and Investments

Prerequisites: (PETE 5333 and PETE 5343) or consent of instructor.

Description: Evaluation techniques for oil and gas properties focusing on economic analyses, reserves estimations and decision making. Evaluate three independent investment opportunities as class projects. Previously offered as ENGR 5363.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Chemical Engineering

PETE 5373 Advanced Well Stimulation

Prerequisites: Permission of instructor.

Description: Hydraulic fracturing simulation and design. Unconventional resource rock mechanics and hydraulic fracturing concepts. Multistage hydraulic fracturing and fracture treatment analysis. Matrix acidizing and evaluation of treatments through methods of pumping pressure analysis. Previously offered as ENGR 5373.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Chemical Engineering

PETE 5413 Advanced Well Design and Operational Analysis

Prerequisites: PETE 4313 or consent of instructor.

Description: Topics include information needed to plan oil or gas wells; planning the authorization for expenditures (AFE) budget; use of offset data analysis from logging and drilling for planning; pore and fracture pressure prediction; casing design; wellbore stability, drilling hydraulics, wellbore strengthening considerations in designing the mud weight window; drilling fluids and cements laboratory exercises using latest technologies/materials; completion/stimulation and real time drilling analysis.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Chemical Engineering

PETE 5513 Directional Drilling

Prerequisites: PETE 4313 or PETE 5313 or consent of instructor.

Description: Study of directional well planning and drilling; tools and operational techniques used in directional drilling; limiting factors of reaching a predetermined subsurface target.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Chemical Engineering

PETE 5613 Advanced Well Completions

Prerequisites: Consent of instructor.

Description: Topics include selection of well completion type, pipe design, well cementing, perforating, selection of surface and downhole equipment, corrosion mitigation, and well stimulation.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Chemical Engineering

PETE 5990 Special Problems in Petroleum Engineering

Prerequisites: Graduate standing and consent of instructor.

Description: Independent study on specific topics in drilling, production and reservoir engineering. Offered for variable credit, 1-5 credit hours, maximum of 5 credit hours.

Credit hours: 1-5

Contact hours: Other: 1

Levels: Graduate

Schedule types: Independent Study

Department/School: Chemical Engineering

PETE 6000 Doctoral Thesis

Prerequisites: Consent of major professor.

Description: The doctoral candidate registers for 1-15 semester credit hours each semester during which laboratory work is in process. Methods used in research and thesis writing. An original investigation of a problem in Petroleum Engineering and its report in a dissertation. Offered for variable credit.

Credit hours: 1-15

Contact hours: Other: 1

Levels: Graduate

Schedule types: Independent Study

Department/School: Chemical Engineering

PETE 6110 Advanced Topics in Petroleum Engineering

Prerequisites: Consent of major professor.

Description: Specialized course addressing advanced topics in drilling, production, or reservoir engineering. May be repeated for credit if subject matter varies.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Chemical Engineering