

Natural Gas Engineering (NGEN)

NGEN 3122 Reservoir Engineering Lab 1 SCH (0-3)

Experimental study of various petroleum reservoirs properties including, porosity, permeability, pore pressure, rock compressibility, rock resistivity, and capillary pressure. Prerequisite: Junior standing in engineering. Credit for or current registration in CHEN 3322.

NGEN 3193 Drilling Engineering Lab 1 SCH (0-3)

Standard laboratory testing of drilling fluids including density, marsh viscosity, rheology, retort kit separation, API filter press-static filtration, lubricity and electrical stability. Prerequisite: Junior standing in engineering. Credit for or current registration in CHEN 3393 required.

NGEN 3322 Fund of Reservoir Engineering 3 SCH (3-0)

Physical properties of petroleum reservoir rocks, lithology, porosity, fluid saturations, permeability and capillary characteristics as they relate to the production of oil and gas. Properties of hydrocarbon systems. Material balance methods. Flow of fluids in porous media. Prerequisites: CHEM 3323 and GEOL 4307/GEOL 4107. Credit or registration in CHEM 3123 and CHEN/NGEN 3392.

Fee: \$5.00

NGEN 3373 Nat Gas Property Evaluation 3 SCH (3-0)

The course is designed to give an overview on the definition of resources/reserves, formation evaluation (production forecast and reserves estimate), and petroleum economics. The students acquire the background of basic economics in evaluating an oil and gas property. The requirement also includes the engineering calculations that are needed for estimating cost and profit associated with a project. Prerequisite: NGEN 3392.

NGEN 3392 Fluid Transport Phenomena 3 SCH (3-0)

Fundamentals of momentum transport including fluid statics, flow of compressible and incompressible fluids, pumps, turbines, and compressors, with computer applications. Prerequisite: MATH 3320; credit or registration in MEEN 2355 or MEEN 2302. (Credit may not be obtained in both NGEN 3392 and CHEN 3392.)

NGEN 3393 Natural Gas Drilling Engg 3 SCH (3-0)

Introduction to drilling equipment and methods, drilling fluids, casing and cementing of wells. Application of computers to the drilling of wells. Contemporary methods of well completion. Prerequisites: NGEN 3322 and CHEN 3392 or NGEN 3392.

NGEN 4178 Hydrocarbon Measurements Lab 1 SCH (0-3)

Experimental study of hydrocarbon gas and liquid properties and flow rates measurements under different conditions. Several of the experiments are gas flow studies through pipes made of different materials, various types of valves and fittings. Experiments also include Heat Exchanges, Distillation Column, and Gas-Liquid Absorption. Pre-requisite: Senior Standing. Credit or current enrollment in NGEN 4378.

NGEN 4279 Unit Operations Laboratory 2 SCH (0-6)

Selected laboratory experiments in heat and mass transfer. Prerequisite: CHEN 4389. (Credit may not be obtained in both NGEN 4279 and CHEN 4279.)

Fee: \$5.00

NGEN 4297 Capstone Design I 2 SCH (2-0)

Principles of design from conception to completion, and various constraints of designs including, economics, safety, and ethics and environment. The economics will cover time value of money and its application to oil and gas property evaluation. Prerequisites: NGEN 3321 and senior standing in Engineering. Credit for or enrollment in NGEN 4396.

NGEN 4375 Natural Gas Distribution 3 SCH (3-0)

Pipeline and compressor station design. Pipeline integrity and environmental issues associated with pipeline placement and design. Prerequisite: CHEN 3392 or NGEN 3392.

NGEN 4378 Hydrocarbon Measurement 3 SCH (3-0)

Theory and practice of measurement of hydrocarbon gas and liquid properties and flow. Prerequisites: NGEN/CHEN 3392 and NGEN 4375.

NGEN 4382 NG Cryogenics and Storage 3 SCH (3-0)

This course provides a comprehensive technical review of the compressed and liquefied Natural Gas (LNG) industry. The course objectives are to describe - the cryogenic flow process of natural gas, LNG specific properties, equipment and technical processes, hazards associated with operations, hazard prevention and mitigation measures, LNG storage, loading/offloading and transportation. Use of computer aided simulation and economic evaluation of LNG facilities design. Prerequisite: NGEN 4389.

NGEN 4383 Natural Gas Processes 3 SCH (3-0)

The design, operation and economics of systems for the utilization of hydrocarbon gases and liquids, the concentration of their components by absorption and fractionation procedures. Use of computer aided design and economic evaluation of facility designs. Prerequisite: CHEN 4389. (Credit may not be obtained in both NGEN 4383 and CHEN 4383.)

NGEN 4387 Seismic Interp & Well-Logging 3 SCH (3-0)

Theory and methods of modern seismic and well log interpretation. Prerequisite: NGEN 3493 or GEOL 3431.

NGEN 4389 Separation Processes 3 SCH (3-0)

Fundamentals of separation processes in petroleum industry, including sedimentation, filtration, centrifugation, thermodynamic phase equilibrium flash calculations, gas absorption, and distillation with computer design applications. Pre-requisites: CHEN 3310 and CHEN 3321.

NGEN 4396 Natural Gas Production **3 SCH (3-0)**

Theory, design and methods of gas well testing and production forecasting. Estimating the value of gas and oil properties. Environmental issues and professional responsibility. Prerequisites: NGEN 3322 / CHEN 3392.

NGEN 4398 Capstone Design II (WI) **3 SCH (3-0)**

In teams, students complete significant design projects that include two or more aspects of natural gas engineering. Prerequisite: NGEN 4297, and student has 6 or fewer credit hours of of NGEN courses to complete in subsequent terms.

NGEN 4478 Hydrocarbon Measurement **4 SCH (3-3)**

Theory and practice of measurement of hydrocarbon gas and liquid properties and flow. Prerequisites: NGEN/CHEN 3392 / NGEN 4375.