

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 NGEN 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 NGEN 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. Credit or registration in 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. Prerequisites: MATH 3320; credit or registration in MEEN 2355.

NGEN 3393 Fundamentals of Drilling Engg 3 SCH (3-0)

Introduction to drilling equipment and methods, drilling fluids, casing and drill string design, bit selection, and cementing of wells. Application of computers to the drilling of wells. Contemporary methods of well completion. Prerequisites: CEEN 3311, NGEN 3322 and 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. Prerequisite: Credit or registration in NGEN 4378.

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

Principles of design from conception to completion, and various constraints of designs including, economics, safety, ethics, and environment. The economics will cover cost estimation, time value of money and its application to oil and gas property evaluation. Prerequisites: CHEN 3321 and credit or registration in NGEN 4396.

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

Pipeline and compressor station design. Pipeline integrity and environmental issues associated with pipeline placement and design. Prerequisites: CHEN 3321 or NGEN 3392.

NGEN 4378 Hydrocarbon Flow Measurement 3 SCH (3-0)

Theory and practice of hydrocarbon properties, and flow measurement through orifice, turbine, ultrasonic, and Coriolis flow meters, and flow meter design. Prerequisite: NGEN 4375.

NGEN 4382 Natural Gas 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 processes 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 study of principles of operation, design, simulation, and economics of processing natural gas and the associated liquids. Use of computer aided design and economic evaluation of facility designs. Prerequisite: NGEN 4389 and NGEN 4375.

NGEN 4387 Well-Logging 3 SCH (3-0)

Theory of well-logging techniques and applications, electrical resistivity, radioactive and acoustic properties of rocks. Interpretation of resistivity, spontaneous potential, gamma-ray, neutron, and sonic logs. Prerequisite: NGEN 3393 and GEOL 4307.

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 production, well testing and production forecasting. Estimating the value of gas and oil properties. Environmental issues and professional responsibility. Prerequisites: NGEN 3393.

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 credit or registration in NGEN 4383, NGEN 4387, and NGEN 4378.