UNIVERSITY of NICOSIA

Course Code	Course Title	ECTS Credits
OGEE-220	Rock and Fluid Properties	8
Department	**Semester**	**Prerequisites**
Engineering	Fall, Spring	GEOL-210
Type of Course	**Field**	**Language of Instruction**
Required	Oil & Gas Engineering	English
Level of Course	**Year of Study**	**Lecturer(s)**
1st Cycle	2nd	Dr Ernestos Sarris
Mode of Delivery	**Work Placement**	**Co-requisites**
Face-to-face	N/A	None

Objectives of the Course:

The main objectives of the course are to:

- Introduce the basic types of rock and fluid properties and their attributes.
- Provide basic understanding of rock and fluid properties necessary for reservoir management and recovery calculations.
- Provide basic understanding of geological and engineering processes used in hydrocarbon recovery.
- Introduce via laboratory exercises the process of measurement of rock and fluid properties.

Learning Outcomes:

After completion of the course students are expected to:

- Explain the physical nature of a reservoir.
- Design appropriate logging and coring programs.
- Discuss reservoir wettability characteristics.
- Classify petroleum fluids and determine their chemical composition.
- Effectively understand, discuss and interpreter the well logs and core test results.

Course Contents:

Theory

- Introduction to the fundamentals of Rock properties.
- Porosity. Significance and definition. Types and Classifications. Canonical and non-canonical methods. Averaging of Porosity.
- Absolute permeability. Mathematical expression and Darcy's Law. Dimensional Analysis. Parallel and serial flow. Affecting factors.
- Mechanical and Electrical properties of reservoir rocks. Rock strength and mechanics. Archie equation. Wettability and clay on Electrical properties.
- Fluid Saturation. Mathematical expressions and rock samples. Special Types.
- Interfacial Tension and Wettability. Definitions, practical aspects. Relationship between Wettability and Irreducible Water saturation.

Laboratory

- Porosity Lab: Bulk, Pore and Grain measurements.
- Permeability Lab: Measurements using Liquids and using Gases.
- Rock Strength Lab.
- Fluid Saturation Lab: Retort Distillation. Dean-Stark Extractions.
- Wettability Lab: Measurements of contact angle. Core samples for Ammott test. USBM method.

Learning Activities and Teaching Methods:

Lectures, in-class examples, laboratory assignments

Assessment Methods:

Homework, laboratory, tests, final exam, lab reports

Required Textbooks/Reading:

Authors	Title	Publisher	Year	ISBN
A. Y. Dandekar	Petroleum Reservoir Rock and Fluid Properties, 2nd Edition	CRC Press	2013	9781439876367

Recommended Textbooks/Reading:

Authors	Title	Publisher	Year	ISBN
D. Tiab, E. C. Donaldson	Petrophysics, Third Edition: Theory and Practice of Measuring Reservoir Rock and Fluid Transport Properties	Gulf Professional Publishing	2011	9780123838483
D. William , Jr. Mc Cain	The Properties of Petroleum Fluids	Pennwell Pub	1990	9780878143351