



University of Nicosia, Cyprus

<b>Course Code</b> OGEE-350	<b>Course Title</b> Well Construction & Completion Design	<b>ECTS Credits</b> 8
<b>Department</b> Engineering	<b>Semester</b> Fall, Spring	<b>Prerequisites</b> OGEE-220, OGEE-320, OGEE-330
<b>Type of Course</b> Required	<b>Field</b> Oil & Gas Engineering	<b>Language of Instruction</b> English
<b>Level of Course</b> 1 <sup>st</sup> Cycle	<b>Year of Study</b> 3 <sup>rd</sup>	<b>Lecturer(s)</b> Dr Sarris Ernestos
<b>Mode of Delivery</b> Face-to-face	<b>Work Placement</b> N/A	<b>Co-requisites</b> None

**Objectives of the Course:**

The main objectives of the course are to:

- Introduce the students to the fundamental concepts of well log interpretation.
- Provide solid knowledge to interpret well logs to in order to make decisions relative to well completion, etc.
- Provide solid knowledge to read well logs, apply the necessary environmental corrections, and perform well log interpretations to hydrocarbon bearing formations and communicate the results effectively.
- Provide solid technical knowledge to conduct library and/or internet search and communicate the results through an oral presentation.
- Provide solid technical knowledge to recognize safety issues including handling radioactive sources.
- Help the students obtain practical knowledge and technical knowhow through simulations with software in the computer laboratory.

**Learning Outcomes:**

After completion of the course students are expected to be able to:

- Evaluate near wellbore damage caused by various operations such as drilling, completion, etc, and quantify effect on well productivity.
- Make justification on selection of stimulation methods (matrix acidizing, hydraulic fracturing and acid fracturing) for different types of reservoir/well candidates.
- Interpret fundamental and criteria of well stimulation to enhance oil/gas recovery and improve reservoir management
- Pre-screen appropriate fracturing fluid, chemical additives, and proppant based on formation conditions.
- Perform optimal design of fracturing treatment on real wells in project by construction of data set, prediction of fracture geometry and determination of

- pumping schedule etc., using 2D fracturing model and pseudo-3D model.
- Cooperate in a team to solve problems in the project
- Provide post-fracturing evaluation by estimate of fracture half length, fracture conductivity, formation permeability and folds of increase in productivity.
- Handle numerical calculations of the hydraulic fracturing technique through computer simulations to predict the fracture pressure and fracture dimensions.

**Course Contents:**

- Introduction & overview: hydraulic fracturing and acidizing
- Productivity enhancement from stimulation and candidate selection
- Rock mechanics, in-situ stress and fracture geometry
- Rheology of fracture fluid
- Mini-frac test
- 2D fracture models and 3D fracture models
- Fracture treatment design
- Tip screen-out design: frac & pack
- Treatment pressure analysis and Post-treatment evaluation
- Acidizing
- Computer simulation laboratory (software tutorials)

**Learning Activities and Teaching Methods:**

Lectures, projects, software simulations, discussion

**Assessment Methods:**

Homework, project assignments, simulation laboratory reports, tests, final exam.

**Required Textbooks/Reading:**

Authors	Title	Publisher	Year	ISBN
M. Economides and G. Martin	Modern Fracturing: Enhancing Natural Gas Production	Energy Tribune Publishing	2007	9781604616880
Schlumberger	Commercial Software: FracCADE	Schlumberger	2009	

**Recommended Textbooks/Reading:**

Authors	Title	Publisher	Year	ISBN
P. Valko and M. Economides	Hydraulic Fracture Mechanics	John Wiley & Sons	1995	0471956643