

Course unit title:	Oil & Gas Exploration, Processing and Exploitation		
Course unit code:	OG302		
Type of course unit:	Elective		
Level of course unit:	BSc		
Year of study:	3 rd		
Semester when the unit is delivered:	6 th		
Number of ECTS credits allocated :	5		
Name of tentative lecturer(s):	Prof. Christodoulos Chistodoulou, Dr. Antonis Antoniou		
Learning outcomes of the course unit:	<ol style="list-style-type: none"> 1. Acquire a broad knowledge of Fossil Fuels and know their gas emissions (CO₂, NO_x, etc) 2. Know the thermodynamic principles of fuel combustion, be able to write combustion reactions of fuels and calculate their calorific value 3. Know about Oil & Gas offshore and Onshore exploration 4. Know about Oil & Gas drilling methods and piping and upstream production 5. Know about Oil & Gas refining and products, their applications in the energy sector and in the petrochemical industry 6. Know about Natural Gas (NG) processing, liquefaction (LNG), storage, re-gasification, distribution and use in the energy sector and the petrochemical industry 		
Mode of delivery:	Face-to-face		
Prerequisites:	None	Co-requisites:	None
Recommended optional program components:			
Course contents:	<p>Module A - Fossil Fuels (Coal, Oil, Natural Gas)</p> <ul style="list-style-type: none"> • Chemical composition • Combustion of fuels • Exhaust gases, gas emissions(NO_x, SO₂) • Purification <p>Module B - Combustion Thermodynamics</p> <ul style="list-style-type: none"> • Enthalpy and free energy of reaction • Spontaneous reactions • Complete and incomplete combustion reactions • Lower Calorific value (LCV) and Higher Calorific Value (HCV) <p>Module C - Oil & Gas exploration (Onshore and Offshore) Geological surveys, Onshore and offshore seismology, Magnetometers, Gravimeters</p> <p>Module D - Oil & Gas drilling and pipelines</p> <ul style="list-style-type: none"> • Drilling Methods • Upstream production • NG pipelines <p>Module E - Oil & Gas refining</p> <ul style="list-style-type: none"> • Downstream production facilities • Natural Gas refining and production <p>Module F – Liquefied Natural Gas (LNG)</p> <ul style="list-style-type: none"> • LNG production (Liquefaction) • LNG storage • LNG transportation 		

	<ul style="list-style-type: none"> • LNG re-gasification and distribution <p>Module G – Oil & Gas Exploitation</p> <ul style="list-style-type: none"> • Oil distillation • Oil products (asphalts, heavy fuel, gasoline, diesel, LPG) • Petrochemicals (polyethylene, Methanol, Ammonia, LTG) • Hydrogen production by NG reforming and water gas shift reaction • Other petroleum products <p>Module H – Oil & Gas Applications</p> <ul style="list-style-type: none"> • Power generation (Electricity and Heat) • Transportation • Hydrogen and NG Fuel Cells
Recommended and/or required reading:	
Textbooks:	“Fundamentals of Natural Gas Processing”, Arthur Hidnay, Taylor & Francis, 2007
Software:	
References:	<ol style="list-style-type: none"> 1. “Oil & Gas Production in Nontechnical Language” by Martin S. Raymond, PennWell Corp., October 2005 2. “Oil & Gas Pipelines in Nontechnical Language”, Thomas O. Miesner, PennWell Corp., March 2006 3. “Petroleum Refining in Nontechnical Language”, William Leffler, PennWell Corp., 4th Edition, Nov 2008 4. “Operational Aspects of Oil and Gas Well Testing (Handbook of Petroleum Exploration and Production)”, S. McAleese, Elsevier Science, 1st edition, March 2000 5. “Introduction to Chemical Engineering Thermodynamics”, J. M. Smith, Mcgraw Hill Higher Education, 7th edition, Feb 2005
Planned learning activities and teaching methods:	<p>The taught part of course is delivered to the students by means of lectures and video presentations, conducted with the help of computer. Lecture notes and presentations will be available through the web for students to use in combination with the textbooks.</p> <p>Lectures will be supplemented by homework assignments and readings.</p>
Assessment methods and criteria:	<ul style="list-style-type: none"> • Assignments 25% • Mid-Term Exam: 25% • Final Exam 60%
Language of instruction:	English
Work placement(s):	No