

Course Title	LNG Production, Storage, Transport and Use (Specialization in Oil & Gas Engineering)				
Course Code	OG401				
Course Type	Compulsory				
Level	B.Sc (Level 1)				
Year/ Semester	3 <sup>rd</sup> Year / 6 <sup>th</sup> Semester (Spring)				
Teacher's Name	Andreas Pentaliotis, Prof. Christodoulos Christodoulou, Dr. Richard Barnes				
ECTS	6	Lectures / week	3	Laboratories/week	-
Course Purpose	<p>Natural gas is the best transporting in pipelines. There are though regions, such as country-islands (Japan etc) where NG pipeline importing is not possible or is not satisfactory due to high demands. In such cases, Natural Gas needs to be liquefied into LNG and transported via special LNG-Vessels.</p> <p>Natural Gas Liquefaction is an energy demanding process, that's why LNG is much more expensive than NG.</p> <p>The purpose of the course is to give the student an overall view of the Liquefaction process, explain the methods of storing, transporting and regasifying LNG (in LNG terminals). It will also give to the students a perspective on the recent market trends in LNG shipment and the future potential.</p>				
Learning Outcomes	<ol style="list-style-type: none"> <li>1. Describe the main LNG liquefaction process, AP-C3MR.</li> <li>2. Explain the methods of storing and transporting LNG.</li> <li>3. Describe and explain the main type of regasification terminals and method of LNG regasification.</li> <li>4. Describe the recent market trends in LNG shipment and the future potential.</li> </ol>				
Prerequisites	None		Corequisites	None	
Course Content	<ul style="list-style-type: none"> <li>• Natural Gas Composition.</li> <li>• Natural Gas Processing/Purification (Gas/Oil separation, Gas sweetening/dehydration)</li> <li>• Natural Gas Storage (Compressed Natural Gas (CNG), Liquid Natural Gas (LNG)).</li> </ul>				

	<ul style="list-style-type: none"> <li>• Natural Gas Terminal (Mainland, island, Platform terminals)</li> <li>• LNG production by Natural Gas Liquefaction (refrigerants, heat-exchangers, compressors, refrigeration process)</li> <li>• LNG Storage (above-ground, in-ground, under-ground storage).</li> <li>• LNG Transport (LNG pipe transfer, sea-transport)</li> <li>• LNG Re-gasification to Natural Gas (heat-exchangers for LNG).</li> <li>• LNG Markets (Producers, Consumers, Market Trends)</li> </ul>
Teaching Methodology	<p>Power Point Presentation of Lectures, Questions, Discussion</p> <p>Explanations with examples, Reviews.</p> <ul style="list-style-type: none"> <li>• Lectures for learning the theory and fundamentals of the LNG Production Technologies, Utilisation, Trading and Market Operations</li> <li>• Explain with specific examples all aspects of the LNG Value Chain</li> <li>• Give to the students assignments for independent study of different subjects related to the LNG Market</li> <li>• Tutorials, where the students ask further questions on the lectures for better comprehension</li> <li>• Frequent reviews and live discussions</li> </ul>
Bibliography	<p><b>Suggested Textbook:</b></p> <p>LNG: Basics of Liquefied Natural Gas</p> <p><b>Reference Books:</b></p> <p>LNG, A Nontechnical Guide, Michael D. Tusiani &amp; Gordon Shearer</p> <p>Fundamentals of Natural Gas Processing, Arthur Hidnay, Taylor &amp; Francis, 2007</p> <p>Oilfield Processing of Petroleum, Volume 1: Natural Gas</p> <p>“BP Statistical review of world energy” June 2013</p>
Assessment	<ul style="list-style-type: none"> <li>• Assignments + Mid-Term Exam      40%</li> <li>• Final Exam                                      60%</li> </ul>
Language	English