

MEER505 LNG Processing, Storage, Transport, Regasification, Distribution and Usage

Course Title	LNG Processing, Storage, Transport, Regasification, Distribution and Usage				
Course Code	MEER505				
Course Type	Elective				
Level	Masters (2 nd Level)				
Year / Semester	1 st year/ 2 nd semester or 2 nd year/ 3 rd semester				
Teacher's Name	Mr. Andreas Pentaliotis				
ECTS	10	Lectures / week	3	Laboratories/week	0
Course Purpose	<p>LNG is natural gas that has been converted to liquid form by cooling -160C for the ease of storage, transportation and distribution. Natural gas currently accounts for 22% of aggregate global energy supply. Its popularity as an energy source is expected to grow substantially in the future because LNG can help achieve two important energy goals for the twenty-first century— providing the sustainable energy supplies and services needed for social and economic development and reducing adverse impacts on global climate and the environment in general.</p> <p>This course will highlight the wide array of LNG business features from beginning to the end. This training course is designed to help students to expand their knowledge and stay top of LNG business dynamics. This course will feature:</p> <p>The fundamentals of LNG, production, transportation, pricing and its business economics. Global supply-demand, global production and global market dynamics will also be discussed and analysed. An analysis of technical, commercial, contractual business transactions of LNG will also be presented. Technical and economic success factors in business to support strategic initiatives; to mitigate risk; and to direct operational decision making on the LNG trading will also be presented.</p>				
Learning Outcomes	<p>By the end of the course, students must be able to:</p> <ol style="list-style-type: none"> 1. Understand the main LNG liquefaction processes. 2. Know the methods of storing and transporting LNG. 3. Understand the types of regasification terminals and methods of LNG regasification. 4. Understand the recent market trends in LNG shipment and the future potential. 				
Prerequisites	MEE510	Corequisites	None		
Course Content	<ol style="list-style-type: none"> 1. Gas chemistry and production <ul style="list-style-type: none"> - Composition - Molecular weight - Specific gravity - Compressibility - Associated & non associated gas - Gas oil separation - Compression train 2. Gas treatment <ul style="list-style-type: none"> - Gas sweetening, amine, solvents - Molecular weight Gas dehydration – glycol, mol sieve - HC dew pointing – refrigeration, JT valve, turboexpander - Other processes – IFPEX, membrane 3. LNG production <ul style="list-style-type: none"> - Refrigeration process - Cascade process - Single mixed refrigerant - Propane mixed refrigerant - Dual mixed refrigerant - Nitrogen refrigerant - Floating LNG - CompactLNG 4. LNG Storage <ul style="list-style-type: none"> - Single containment tanks - Double containment tanks - Full containment tanks 				

	<ul style="list-style-type: none"> - Membrane tanks - Underground storage tanks - Underground gas storage <p>5. LNG Shipping</p> <ul style="list-style-type: none"> - Moss tanker - Membrane tanker <p>6. LNG import terminals</p> <ul style="list-style-type: none"> - Mainland terminal - Island terminal - Platform terminal - FSRU - Process scheme - Recovery of low temperature <p>7. Natural gas distribution and usage</p> <ul style="list-style-type: none"> - Gas transmission networks - Let-down stations - Industrial users <p>8. Gas compression and transport</p> <ul style="list-style-type: none"> - Types of compressor – reciprocating, centrifugal, axial - Compressor power - Discharge temperature - Pipeline design - Onshore pipelines - Offshore pipelines <p>9. LNG alternatives</p> <ul style="list-style-type: none"> - CNG - GTL - Petrochemicals <p>10. LNG markets</p> <ul style="list-style-type: none"> - Producers - Consumers - Market trends 						
Teaching Methodology	The taught part of the course is delivered to the students by means of lectures, conducted with the help of computer presentations. Lecture notes and presentations are available through the web for students to use in combination with the textbooks.						
Bibliography	<p>Textbook: Francis S. Manning, Richard E. Thompson, Oilfield Processing of Petroleum, Volume 1: Natural Gas, PenWell Books, 1991.</p> <p>Reference Books:</p> <ul style="list-style-type: none"> - Dudley, B. (2018). BP statistical review of world energy. <i>BP Statistical Review, London, UK, accessed Aug, 6, 2018.</i> 						
Assessment	<p>Students will be assessed through:</p> <ul style="list-style-type: none"> - A midterm test at the 7th week of the course - A personal assignment which will be handed out at the beginning of the semester (week 2) and will be collected by completion of semester (week 12). - A final test at the end of the semester, in which all material will be examined. <p>The weights of the course assessment are as follows:</p> <table style="margin-left: 20px;"> <tr> <td>Assignments</td> <td>25%</td> </tr> <tr> <td>Midterms</td> <td>25%</td> </tr> <tr> <td>Final Exam</td> <td>50%</td> </tr> </table>	Assignments	25%	Midterms	25%	Final Exam	50%
Assignments	25%						
Midterms	25%						
Final Exam	50%						
Language	English						