



Course Syllabus

Course Code	Course Title	ECTS Credits
MBAN-765	LNG Systems and Markets	6
Prerequisites	Department	Semester
None	School of Business	Fall, Spring
Type of Course	Field	Language of Instruction
Concentration	Energy, Oil & Natural Gas	English
Level of Course	Lecturer(s)	Year of Study
2 nd Cycle	Dr Constantinos Hadjistassou	1 st or 2 nd
Mode of Delivery	Work Placement	Prerequisites
Face to Face	N/A	None

Course Objectives:

The main objectives of the course are to:

- Present an overview of the natural gas and liquefied natural gas (LNG) industry;
- Outline the major LNG importers and exporters and the LNG value chain;
- Familiarise attendees with natural gas exploration, production and treatment;
- Introduce the process of LNG production and storage & export and receiving facilities;
- Analyse the financial, physical risks and hazards associated with LNG facilities;
- Discuss the financing arrangements for onshore and offshore LNG projects;
- Analyse the LNG sales and purchase agreements;
- Discuss the economics of LNG projects and gas supply agreements;
- Construction, operational and business aspects of LNG units;
- Familiarise participants with LNG ship contracts;
- Elaborate on the major ship conventions and regulations;
- Explain the health, safety, environmental and security (HSES) issues of LNG assets.

Learning Outcomes:

After and during the completion of the course students are expected to:

- Appreciate the evolution of the natural gas and the LNG industry;
- Become familiar with the major LNG exporters and importers and the LNG value chain;
- Gain an overview of natural gas exploration, production and treatment phases;
- Appreciate the non-technical aspects of natural gas liquefaction;
- Describe the types of LNG storage, export and receiving assets;
- Recognize the financial and physical risks and hazards associated with LNG plants;
- Detail the different financing arrangements for LNG projects;
- Propose various LNG sales and purchase agreements;

- Evaluate the viability of LNG projects and upstream gas supply contracts;
- Be aware of the LNG onshore and offshore storage options;
- Offer their opinion about the construction, running and business operations of LNG plants;
- Learn the main LNG types of carriers (ships) and LNG vessel contracts;
- Possess a sound knowledge of marine vessel conventions and regulations;
- Elaborate on the health, safety, environmental and security (HSES) matters of LNG plants.

“Details on the contribution of the course’s learning outcomes towards the learning goals / competencies and learning objectives of the programme are included in the curriculum map of each programme”.

Course Content:

The Course outline is developed over 12 weeks by focusing each week on the following topics:

1. History, emergence and evolution of the natural gas and LNG industry;
2. Major, emerging LNG exporters and import countries and LNG value chain;
3. Overview of gas exploration, production and treatment;
4. The LNG process including contemporary liquefaction cycles;
5. Above and below ground LNG storage tanks and floating, storage & regas units (FSRUs);
6. Assessment of financial and physical risks related to LNG plants;
7. Supply project structure, LNG pricing and off-take, project ventures, financing, risk mitigation, LNG brokers, project performance;
8. Long-term and flexible contracts, re-export provisions, pricing mechanisms, volumes, gas quality, transportation, oil-tied arrangements, supply and demand;
9. Upstream and project capital costs, LNG train investment, storage and pipeline costs, gas supply agreements, gas quality and quantity, delivery of gas;
10. Main LNG ship types, LNG ship contracts, tanker management, crewing, LNG chartering, and spot LNG vessels;
11. International shipping conventions e.g., IMO related MARPOL, SOLAS, STCW, hazardous cargo, loading/unloading operations;
12. Environmental impact assessment studies, permitting issues, pollution considerations and LNG physical risks such as roll-over, sloshing and cyber-security threats.

Learning Activities and Teaching Methods:

Online Lectures, case studies, in-forum examples, in forum discussion, exercises.

Assessment Methods:

Assignment(s), in forum participation, mid- and final exam.

Required Textbooks/Readings:

Title	Author(s)	Publisher	Year	ISBN
LNG: Fuel For a Changing World – A Nontechnical Guide	Tusiani MD, Shearer G	PennWell	(2016)	9781593703691

Recommended Textbooks/Readings:

Title	Author(s)	Publisher	Year	ISBN
The European Gas Markets: Challenges and Opportunities	Manfred Hafner, Simone Tagliapietra	Palgrave Macmillan	2017	9783319558011
Natural gas: fuel for the 21 st century	Smil V.	Wiley	2015	9781119012863