APPLIES TO ACADEMIC YEAR 2016/2017

GRA 8503 The Oil Fundamentals

Programme
Executive Master of Management in Energy (EMME)

Responsible for the course
Jon Lereim, (IFP)

Department
Department of Leadership and Organizational Behaviour

Term
According to study plan

ECTS Credits
5

Language of instruction
English

Introduction
This course is part of the Executive Master of Management in Energy in cooperation with BI Norwegian Business School and IFP School.

The history of petroleum is inseparable from that of the major oil companies (NOCs and IOCs) which formed and grew rapidly in order to seek, produce, transform, transport and sell oil and oil products. The understanding of the key components and the challenges of upstream business will give the participants the ability to build their own vision on the future of oil industry.

Learning outcome
Acquired knowledge
Participants will receive a comprehensive understanding of the energy scene (international energy outlook) and a clear view of the upstream sector in all its aspects: reserves, technologies, innovations, players (IOCs, NOCs and contractors), investments, costs and taxation systems. This is followed up by sessions devoted to downstream business like refining and petrochemicals economics with a focus on refining margins and demand volatilities. Finally sessions dedicated to trading and risk management of oil products will be provided.

Acquired skills
Upon completion of this first week, the students will be able to:
- Describe the key technical, innovative and economic features of the oil industry and its major players
- Identify and analyse the different components of the crude oil price and the evolution of the by-products prices (petroleum products and chemicals)
- Analyse the techno-economics of the upstream sector in all its aspects: reserves, players (IOCs, NOCs and Contractors), investments, costs, benchmarking, risk management, etc.
- Analyse the techno-economic framework of the downstream part of the oil business: refining and petrochemicals

Reflection
- Explain how crude oil is traded in the physical market and how hedging strategies are implemented
- Evaluate the risk of traded products such as futures, swaps and options in the oil market

Prerequisites
Granted admission to the Executive Master of Management in Energy programme.

Compulsory reading

Other:
Compulsory reading (before the module)

Exploration and production
- Five 2-page papers with a glossary: 1.What a hydrocarbon field is / 2.Geology-Geophysics / 3.Drilling / 4.Development of a field / 5.Production of a field
- John Brodman, Ifri, actuelles de l'Ifri, The U.S. Oil and Gas boom, 2012 (overview of the shale gas/oil and very clear explanation of the differences between oil shale, shale oil and tar sands)
- Rice University, James A. Baker III Institute for Public Policy, The status of oil reserves, October 2011 (Conventional and unconventional resources in the future supply mix)
- Fattouh Bassam & Sen Amrita, The US Tight Oil Revolution in a global perspective, The Oxford Institute

for Energy Studies, September 2013 (the neglected impacts of this revolution)
- Johnston D & Johnston D, International Petroleum Fiscal System Analysis – State of Play, OGEL (Oil, Gas & Energy Law Intelligence), March 2011 (It discusses the various issues and economic logic that form the basis of modern analysis of a typical fiscal system)
- Darmois Gilles, Sharing the oil rent, current situation and good practice, Editions Technip, 2014
- Video: Stanford University, Woods Institute, "The Future of Oil" by Robert Horne (resources, reserves, recovery rate, depletion, etc.)
http://www.youtube.com/watch?v=KTsYjRqPmNA
- Video: /www.europeunconventionalgas.org/technology-and-process (Process of Hydraulic Fracturing)

Refining and Petrochemicals
- 2-page papers with a glossary

Oil & Products Trading
- A 3-page paper on Oil Markets (spot, forward and futures markets)
- Video: Energy Hedging Terminology, http://www.cmegroup.com/education/interactive/webinars-archived/energy-hedging-terminology.html (Energy Trading and Hedging Jargon, NYMEX)
How to make a deal in a financial commodity exchange? Anatomy of a trade (NYBOT)
http://www.youtube.com/watch?v=AFJ5ll_C4EY
- What is a future contract? NYMEX Future Contracts: http://www.youtube.com/watch?v=HMOLE1HzPSg

Recommended reading

Other:
Supplementary / recommended reading (before / during / after the module)

Energy
- “Beyond Smoke and Mirrors: Climate Change and Energy in the 21st Century”, Burton Richter, Cambridge University Press
- “The Global Oil & Gas Industry”, Andrew Inkpen, Michael Moffett PennWell, 2011

Oil
“Oil: a beginner’s guide”, Valcav Smil, ONEWORLD Oxford

Exploration and production
"Oil and Gas Exploration and Production", Bret-Rouzaut, Favennec, Editions Technip, 2010

Refining and Petrochemicals
- “Petroleum refining: Refinery Operation and Management”, J.P. Favennec, Editions Technip.
- “Petroleum Refining for the Non-technical Person”, W.L. Leffler, PennWell Edition.

Oil & Products Trading
Fattouh, B, 2011, "An Anatomy of the Crude Oil Pricing system", WPM 40, Oxford Institute for Energy Studies
Hull, J.C., 2006, Options Futures and other derivatives, Pearson
International Energy Agency, 2011, The Mechanics of the Derivatives Markets. What They Are and How They Function, (http://omrpublic.iea.org/special_sup_apr11.pdf)

Mabro, R.,1984 On Oil Price Concepts. WPM3, Oxford: Oxford Institute for Energy Studies

Video: Robert Schiller, Lessons on on Forward and Futures Markets
http://www.youtube.com/watch?v=X_rfROvI9j4
Robert Schiller, Lesson on Exchanges, Brokers, Dealers, Clearinghouses
http://www.youtube.com/watch?v=kAI8DezwLAE&playnext=1&list=PLDC67C77DEF11FD0D

Course outline
The Global Energy Outlook
- Global energy production and consumption
- Future of Energy demand: constraints, challenges, opportunities
- Oil price, energy price – Influence of supply, demand, futures markets
- The actors of the energy scene
- International Energy agency (IEA) Conference : Debate with IEA Experts

Oil Exploration and Production:
- Key figures in Upstream (challenges & players) & New debates
- Oil Reserves, Investments and Costs
- Legal and Fiscal Aspects : Concession, Production Sharing Contract, Service Contract
- Crisis management in upstream

Downstream Techno-economics
- Oil refining, refining margins and costs components.
- Petrochemicals and their economic framework
- Maritime and Pipe-line transportation

Introduction to Trading & Risk Management:
- Oil pricing regime & Oil price formation
- Spot, forward & futures markets
- Hedging & risk assessment

Computer-based tools
It's Learning

Learning process and workload
1 ECTS credit corresponds to a workload of 26-30 hours.

Attendance to all sessions in the course is compulsory. If you have to miss part(s) of the course you must ask in advance for leave of absence. More than 25% absence in a course will require retaking the entire course. It's the student's own responsibility to obtain any information provided in class that is not included on the course homepage/ It's learning or other course materials

Examination
The students are evaluated through an individual 2 hours written exam, counting for 5 credits.

Specific information regarding student evaluation beyond the information given in the course description will be provided in class.

Examination code(s)
GRA 85031 - Written exam; counts for 100% to pass the course GRA 8503; 5 credits.

The course is a part of a full Executive Master of Management in Energy (EMME) and examination in all courses must be passed in order to obtain a certificate.

Examination support materials
None

Re-sit examination
Re-takes are only possible at the next time a course will be held. When course evaluation consists of class participation or continuous assessment, the whole course must be re-evaluated when a student wants to retake a exam. Retake examinations entail an extra examination fee.

Additional information