UNIVERSITI TEKNOLOGI MARA

CMT668: PETROLEUM TECHNOLOGY

Course Name (English)	PETROLEUM TECHNOLOGY APPROVED
Course Code	CMT668
MQF Credit	3
Course Description	The course comprises description of the chemical composition and physical properties of petroleum, petroleum products, natural gas and petrochemical feedstocks. This includes methods for fractionation and analysis, the chemical basis of the central refinery processes and an overview of the spectrum of products from oil refining. Additional subjects include natural gas and petrochemical processing, and economics.
Transferable Skills	Upon completion of this course, the students should be able to; 1. Relate and explain. the chemical composition and properties of crude oil , petroleum products, petrochemical and natural gas 2. Describe and demonstrate the basic principles and concepts in petroleum, natural gas and petrochemical treatment and processing 3. Restate and illustrate the different manufacturing processes involved in the treatment and processing of crude oil, natural gas and petrochemical. 4. Verbally and visually relate and discuss the factors which govern the processing design of crude oil , natural gas and petrochemical processes 5. Apply and appraise data for an economic evaluation in order to analyse and determine economic problems and their impact on the manufacturing processes of crude oil and natural gas.
Teaching Methodologies	Lectures
CLO	CLO1 State and explain terms associated with crude oil and natural gas feedstock and products characterization, petroleum and natural gas processes such as distillation, fractionation, conversion processes and treatment processes. CLO2 Restate and identify the different types of treatment processes which are desalting, solvent extraction and hydrotreating. CLO3 State, identify and describe the different types of conversion processes in petroleum processing for example thermal cracking, flexicoking, catalytic cracking, catalytic reforming an hydrocracking. CLO4 Examine and differentiate the processes involved in the treatment and processing of crude oil, natural gas and petrochemical.
Pre-Requisite Courses	No course recommendations

Topics
1. Introduction 1.1) Formation of coal and crude oil 1.2) Crude oil exploration 1.3) Chemical Compositions of Petroleum 1.4) Refinery Feedstocks 1.5) Refinery Products 1.6) History of Oil and Gas in Malaysia
2. Natural Gas processing 2.1) Natural Gas Treatment 2.2) Natural Gas Processes 2.3) Gas to liquid technology

3. Crude Distillation 3.1) Desalting crude oils 3.2) Atmospheric and vacuum distillation 3.3) Crude distillation unit products 3.4) Auxillary Equipment Treatment methods
4. Conversion processes 4.1) Thermal and Coking Processes 4.2) Catalytic Cracking Processes 4.3) Catalytic Reforming and Isomerisation 4.4) catalytic dewaxing 4.5) Hydrocraking
5. Treatment Processes 5.1) Hydrotreating 5.2) Solvent extraction, solvent dewaxing, solvent deasphalting, Sweatening Processes
6. Petrochemical Processes 6.1) Aromatics Production 6.2) Unsaturated Production 6.3) Saturated Production
7. Coal processing 7.1) coal gasification 7.2) coal liquefaction

Assessment Breakdown	%
Continuous Assessment	60.00%
Final Assessment	40.00%

Details of Continuous Assessment

Assessment Type	Assessment Description	% of Total Mark	CLO
Assignment	One assignment	20%	CLO2
Quiz	Written quiz on the fundamental of petroleum technology including crude and natural gas processes.	20%	CLO1
Test	One written test	20%	CLO3

Reading List

Recommended Text

- **James H. Gary and Glenn E. Handwerk, *Petroleum Refining, Technology and Economics*, 3rd Edition Ed., Marcell Dekker, Inc, New York and Basel**
- **Chauvel and Lefebvre, 1989, *Petrochemical Process-Technical and Economic Characteristics; 1 Synthesis-Gas Derivatives and Major Hydrocarbon*, Technip Edition, Ed.**
- **Solomon and Fryhle 2004, *Organic Chemistry*, 8th Edition, Ed., Wiley International,**
- **Shreve 1980, *Chemical Process Industries,*, 5th edition Ed., McGraw Hill New York**

Reference Book Resources

- **ASTM, *ASTM Handbook; Significance of Testing of Petroleum Products***
- **Kirk & Other 1984, *'Encyclopeadia of Chemical Technology'*,, John Wiley & Sons New York,**

Article/Paper List: This Course does not have any article/paper resources

Other References: This Course does not have any other resources