



## Module (Course Syllabus) Catalogue

### 2022-2023

College/ Institute	Koya Technical institute	
Department	Petroleum Technology /Chemical Analyzing	
Module Name	Oil and Gas Properties	
Module Code	OGP204	
Degree	Technical Diploma <input checked="" type="checkbox"/>	Bachelor <input type="checkbox"/> High Diploma <input type="checkbox"/>
	Master <input type="checkbox"/>	PhD <input type="checkbox"/>
Semester	3	
Qualification	PhD	
Scientific Title	Lecturer	
ECTS (Credits)	7	
Module type	Prerequisite <input type="checkbox"/>	Core <input checked="" type="checkbox"/> Assist. <input type="checkbox"/>
Weekly hours		
Weekly hours (Theory)	(2) hrs. Class	(175) Total hrs Workload
Weekly hours (Practical)	(2) hrs. Class	( ) Total hrs Workload
Number of Weeks	16	
Lecturer (Theory)	Kardo Sardar Mohammed	
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Lecturer (Practical)	Kardo Sardar Mohammed	
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# Course Book

<p><b>Course Description</b></p>	<p>This course is designed to provide the student with an opportunity to gain knowledge about origin and generation of hydrocarbons, exploration and drilling techniques, the physical and chemical properties of hydrocarbon in additions to some tests and also techniques which apply during all processes from up-middle - downstream in petroleum industry.</p>
<p><b>Course objectives</b></p>	<p>To ensure that all students have a basic knowledge and understanding of oil and gas properties and also the origin hydrocarbon, physical and chemical properties and the main test which do for crude oil.</p>
<p><b>Student's obligation</b></p>	<ol style="list-style-type: none"> <li>1. Students have a responsibility to respect all staff members and fellow students. They have a responsibility to conduct themselves in a manner that does not disrupt, distract, or interfere in any way with the teaching and learning process.</li> <li>2. Students have a responsibility to arrive at class on time.</li> <li>3. Students have a responsibility to be prepared for class with the appropriate materials and take care of all textbooks assigned to them.</li> <li>4. Students have a responsibility to follow the institute's regulations regarding leaving the classroom. Students have a responsibility to secure a pass from their teacher in order to leave the classroom and to show that pass.</li> <li>5. Students have a responsibility to conduct themselves in an appropriate manner during passing and whenever they are in the halls of the institute. Students have a responsibility to behave in such a way that the safety of others is not jeopardized by their acts.</li> <li>6. Participate in all exams of the subject without absenting.</li> <li>7. Discusses students' suggestions, opinions and questions at teacher office hours.</li> <li>8. Preparing reports, seminars and other activates.</li> </ol>
<p><b>Required Learning Materials</b></p>	<p>Teaching by presentation: lecture, reading to the class, report, exposition, showing, displaying, teaching by example, demonstrating.</p>

<b>Evaluation</b>	<b>Task</b>		<b>Weight (Marks)</b>	<b>Due Week</b>	<b>Relevant Learning Outcome</b>
	Paper Review				
	Assignments	Homework	5%		
		Class Activity	2%		
		Report	5%		
		Seminar	5%		
		Essay			
		Project			
	Quiz		8%		
	Lab.		10%		
	Midterm Exam		25%		
	Final Exam		40%		
Total		100%			
<b>Specific learning outcome:</b>	<ol style="list-style-type: none"> <li>1. An overview of hydrocarbon origin</li> <li>2. Chemical composition of hydrocarbon.</li> <li>3. Chemical and physical properties.</li> <li>4. Evaluation of oil and gas.</li> </ol>				
<b>Course References:</b>	<ol style="list-style-type: none"> <li>1. Fundamentals of Petroleum and Petrochemical Engineering, CHEMICAL INDUSTRIES, A Series of Reference Books and Textbooks, Founding Editor, HEINZ HEINEMANN, Berkeley, California, Series Editor, JAMES G. SPEIGHT, CD &amp; W, Inc., Laramie, Wyoming, 2011</li> <li>2. Baker Hughes INTEQ, 1999, petroleum geology, Training &amp; Development, 2520 W.W. Thorne Houston, TX 77073, United States of America, 254p.</li> <li>3. Rondeel, H.E., 2001, HYDROCARBONS, <i>Tekst voor de cursus Grondstoffen en het Systeem Aarde (HD 698)</i></li> </ol> <p><u>Journals:</u></p> <ol style="list-style-type: none"> <li>1. Oil &amp; Gas Journal</li> <li>2. Journal of Petroleum Geology</li> <li>3. International Journal of Oil, Gas and Coal Technology.</li> </ol>				

Course topics (Theory)	Week	Learning Outcome
An introduction of Petroleum	1	Definition+ History of Petroleum Use +generalities of the origin of hydrocarbon
Petroleum system+ drilling techniques	1	Source rock + migration+ reservoir+ trap+ Proper timing+ exploration, and methods of drilling...
Crude oil chemical composition	2	<p>A) Hydrocarbon</p> <ul style="list-style-type: none"> <li>• paraffin (Alkenes)</li> </ul> <p>A) Hydrocarbon</p> <ul style="list-style-type: none"> <li>• Naphthenes (cycloalkanes).</li> <li>• Aromatic.</li> </ul> <p>A) Hydrocarbon</p> <ul style="list-style-type: none"> <li>• Olefin.</li> <li>• Acetylenes.</li> </ul> <p>B) Heterocompounds. (Nonhydrocarbon)</p> <ul style="list-style-type: none"> <li>• Sulfur content.</li> <li>• Nitrogen compound.</li> </ul> <p>B) Heterocompounds. (Non-hydrocarbon)</p> <ul style="list-style-type: none"> <li>• Oxygen compound.</li> <li>• Inorganic salt and minerals.</li> </ul>
Physical and chemical properties of hydrocarbon.	1	Density, Sp.gr, Viscosity.....
Crude oil Natural gas	1	Natural Gas+ Various descriptive terms for natural gas.
Crude oil classification	1	<ul style="list-style-type: none"> <li>• According to the (API)</li> <li>• According to the main compounds</li> <li>• According to the Distillation product.</li> </ul>
Crude oil evaluation	2	
The most important crude oil and its products testing.	1	API degree, Smoke point, Pour point, Due point...etc.
Practical Topics	Week	Learning Outcome
API degree by hydrometer	1	
API degree by bottle	1	

API degree by pycnometer	1	
Smoking point	1	
Close Cup Flash Point	1	

### Questions Example Design

Q.1: Define the following

Crude oil, natural gas

Q.2: Fill the following blanket with a suitable phrase

1. Low sulphur crude oil contains less than.....% sulphur.

Q.3: chose the correct one:

1. The sp.gr of asphalt between .....

a. 0.8-0.97    b. 0.7-0.78    c.0.78-0.79    d.1.00-1.10

Q.4. True and falls.

1. The inorganic theory of hydrocarbon generation more acceptable than the organic theory.

Q.5: a) Give the general formula for the following compound:

(Paraffin, Naphthene).

Q.6: Determine the (API) and Baume` degree for the oil samples were the Sp. gr. is (0.8418) at temperature (60°F):

### Extra notes:

### External Evaluator

The main scope of this course is to give the basic knowledge and understanding of oil and gas properties and also provide basic of chemical composition and also the chemical and physical properties of oil and gas in addition to practical skills required for future works in the oil and gas industry.

*Dr. Kardo Sardar Mohammed* did it clearly in the course syllabus and this course details and covers the main aspects too.

*Mr. Sardasht Rifaat Taher*