



Module (Course Syllabus) Catalogue

College/ Institute	Erbil Technology College	
Department	Petroleum Technology	
Module Name	Petroleum Geology	
Module Code	PEG302	
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	3rd	
Qualification	Ph.D. Student	
Scientific Title	Assist. Lecturer	
ECTS (Credits)	6	
Module type	Prerequisite <input type="checkbox"/>	Core <input checked="" type="checkbox"/> Assist. <input type="checkbox"/>
Weekly hours		
Weekly hours (Theory)	(2)hrs Class	(55)Total hrs Workload
Weekly hours (Practical)	(2)hrs Class	(98)Total hrs Workload
Number of Weeks	12	
Lecturer (Theory)	Revan Kamaran Akram	
E-Mail & Mobile NO.	00964750 493 6361 revan.akram@epu.edu.iq	
Lecturer (Practical)	Bekhal (MSc.), Narin (MSc.) and Bnar (BSc).	
E-Mail & Mobile NO.		
Websites		

Course Book

Course Description	<p>This course is one of the core modules in the department of petroleum technology. It provides the fundamentals besides the full understanding about the upstream oil industry. The significance of oil and gas industry now a day is becoming more and more predominant in world generally, especially when the case is all about a developing the country that we live in. This course intends to propose a basic but not too detailed information about the concept of Petroleum geology with detailed materials covering the generation of oil and gas, migration to reservoir and the general exploration methods is among the coverage of this course.</p>
Course objectives	<p>The students will learn basic information about upstream sectors, which include oil and gas generation, discovering and drilling, rather than the other sectors. This include the theoretical sessions about how the rocks and petroleum were formed and discovered by the modern industrial techniques. However, they learn how to construct and design geological, topographic maps in laboratory by using modern software, and hand drawings.</p>
Student's obligation	<p>Missed classes will not be compensated including the quizzes and the scheduled assignments. The students will lose marks on unattended classes with quizzes unless a legal document or authorized leave is presented, which should explain the excuse of the absence. However, the absent student should take the responsibility for making up the missed lecture. Homework is required by the lecturer from online platforms with recourses that provide hints and tips for the required homework. Reports and presentation of the reports are among the student obligations throughout this course.</p>

Required Learning Materials	<ol style="list-style-type: none"> 1. A hall that suits the student numbers with a functional data show for presenting the lecturers powerpoint. 2. A specified laboratory that occupied by modern computers, for explaining given software and following the steps by the students. 3. Laboratory visits for showing the modern tools that used in the industry. 4. Field trips for specific areas and wells. In order to show the practical sessions of this course. 				
Evaluation	Task	Weight (Marks)	Due Week	Relevant Learning Outcome	
	Paper Review				
	Assignments	Homework	10		
		Class Activity	2		
		Report	14		
		Seminar	14		
		Essay			
		Project			
	Quiz		4		
	Lab.				
	Midterm Exam		16		
	Final Exam		40		
Total		100			
Course References:	<ul style="list-style-type: none"> • Asquith, George B, Krygowski, Daniel & Gibson, Charles R 2004. Basic well log analysis, American Association of Petroleum Geologists Tulsa. • Bjorlykke, Knut 2010. Petroleum geoscience: From sedimentary environments to rock physics, Springer Science & Business Media. • Rabia, Hussain 2002. Well Engineering & Construction, Entrac Consulting Limited London. • Rider, Mh 1996. The geological interpretation of well logs. . Whittles Publishing, Caithness. • Schlumberger 1989. Log interpretation principles/applications, Texas, Schlumberger Educational Services. • Selley, Richard C 1998. Elements of petroleum geology, Gulf Professional Publishing. • Tucker, Maurice E 2003. Sedimentary rocks in the field, John Wiley & Sons. • Tyson, Rv 2012. Sedimentary organic matter: organic facies and palynofacies, Springer Science & Business Media. 				

Course topics (Theory)	Week	Learning Outcome
Course introduction	1	Petroleum geology related sections, Iraqs petroleum history and Kurdistan oil blocks
Rocks	2	Basic geological knowledge about rocks and their formation.
Structural geology	3	Basic introduction to structural geology and the geometries
Stratigraphy	4	Formation nomenclature, layers and their relative dates
Petroleum system	5	Petroleum system explanation and elements
Hydrocarbon generation	6	Basic introduction about oil and gas formation and definition of crude oil and its classifications
Source rock and OM	7	Detailed explanation concerning OM and Srx. And maturation and evaluation tools
Migration and Traps	8	Basic introduction to oil migration and oil traps
Reservoir rocks	9	Detailed information about reservoir rocks and its properties (Porosity and permeability)
Wireline logging-1	10	Explanation of well log environments procedures (CAL, SP)
Wireline logging-2	11	Explanation of well logging analysis (GR, DEN, NEU)
Wireline logging-3	12	Explanation of well logging analysis (Resistivity & Sonic)
Practical Topics	week	Learning Outcome
Introduction to Map Properties and Some Geological Applications	1	General introduction about maps, location on earth, GPS, Data acquisition.
Google Earth applications-1	2	<ul style="list-style-type: none"> • Introduction to google earth • how to input data • how to measure distance • how to create a profile?
Google Earth applications-2	3	<ul style="list-style-type: none"> • How to change the units • how to get directions • how to save a complete map (jpeg file)? • how to save data points
Surfer Model Part.1	4	<ul style="list-style-type: none"> • Surfer installing • Introduction to Surfer • Introduction to menu bar • How to make a grid
Surfer Model Part.2	5	<ul style="list-style-type: none"> • How to create a 2D map (Contour Map) • How to customize the map • How to create a profile section
Surfer Model Part.3	6	<ul style="list-style-type: none"> • Creating 3D map from grid data file • How to add a base for it • Customize the map • How to add scale bar • How to print it
Subsurface map	7	Creating subsurface map and location of wells
Geological column	8	Describing Lithological column and Legends
Petroleum System	9	Describing petroleum system elements
SOM	10	Sedimentary organic matter and its application in Petroleum geology
Wireline logging-1	11	Simple log interpretations (CAL- GR)
Wireline logging-1	12	Simple log interpretations (CAL- GR, Res, DEN and NEU)

1. Theoretical Question Example Design

Q1/Define the followings

- Source rock
- Reservoir rocks
- Cap rocks
- Crude oil
- Formation evaluation

Q2/Mention the Followings

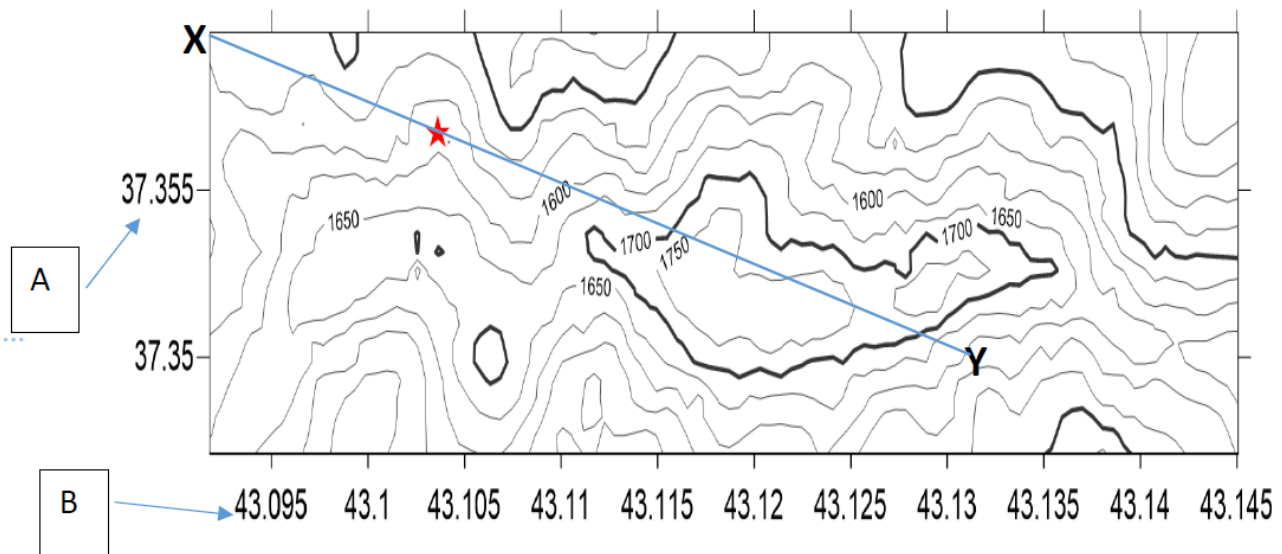
- Types of Organic matter and its potentiality
- Uses of GR log

Q3/fill the blanks with suitable words

- The first well drilled in the Iraq (Kurdistan) was in
- Type II kerogen produces

2. Practical Question Example Design

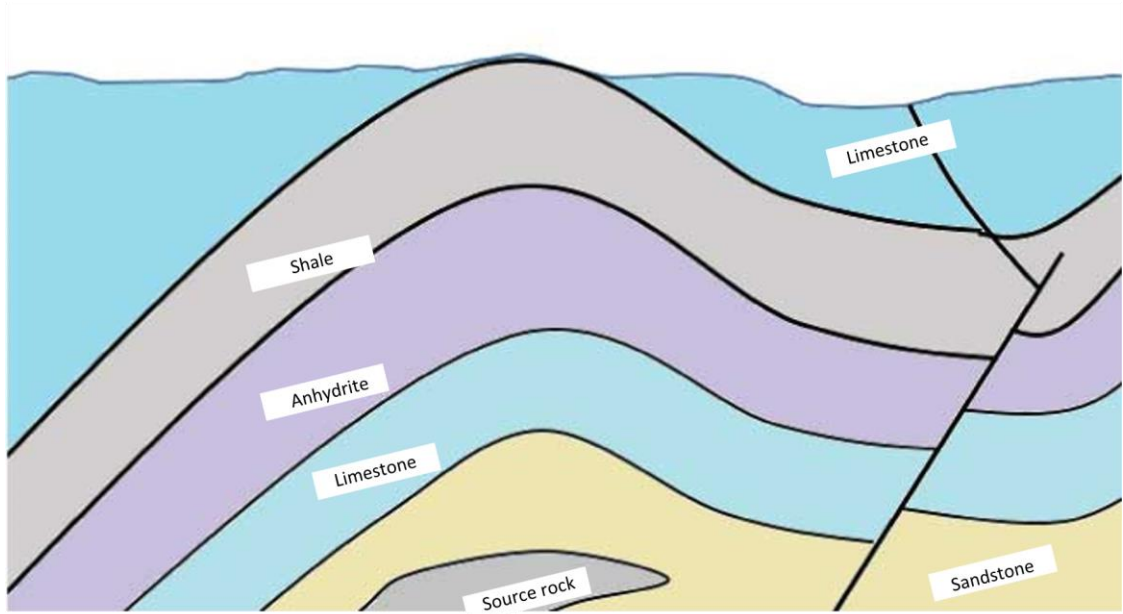
Q1/ On the below map answer the followings.



- 1- Name of this map:
- 2- What is A ----- B ----- on the map.
- 3- Contour interval =
- 4- Star elevation = -----(m).
- 5- What are the missing elements of this map?

Q2/ Answer the followings depending on the diagram.

- 1-Indicate Migration Pathways (types)
- 2- Best area for drilling a well
- 3- is there seepage? If yes indicate on the diagram



4- draw symbols of each lithology.



Limestone



Shale



Anhydrite



Sandstone

Extra notes:

External Evaluator