Third Stage/ Petroleum Geology G307

Course Description Form

Students' understanding of the basic elements in the petroleum system, and students' understanding of the facts and theories of oil formation, students' ability to identify and describe the effects of important geological factors on reservoir properties, porosity and permeability, students' knowledge of sedimentary basins, oil exploration, their locations, and potential risks.

1.Educational Institution	College of Science/ University of Basrah
2. Department	Geology
3. Course name/Code 1. Programs included in it	Petroleum Geology G307
4. Programs included in	Bachelor's, Master's, Doctorate
5. Attendance Form Available	Weekly
6. Semester/ Year	2020-2021
7. Total of study hours	30 hours + 60 practical hours
8. The course description was	prepared in 18/10/2021

9. Aims of the Course

Introduce the student to the geological formations and the various deposits containing oil and how to explore and produce them. It also includes: Introduction to petroleum geology - origin of oil and gas - formation of oil - chemical composition of oil - physical properties of oil - properties of reservoir rocks (porous - permeability) - oil-generating rocks - sedimentary basins - migration and accumulation of oil - oil's relationship with different types of rocks

Especially sedimentary rocks - methods of exploration and oil exploration - oil traps - oil fields in Iraq

10.Course outcomes and methods of teaching, learning and assessment

a- Knowledge and Understanding goals

a. Know the basic elements of the petroleum system
b. Know the facts and theories of the formation of petroleum
c. The ability to describe the geological factors affecting the oil reservoir
d. Determining migration paths
e. Economic importance and methods of exploration for oil
f. Knowledge of oil fields and geological formations containing oil in Iraq

b- Subjective- Specific Skills

The role of geology and its importance in knowing where petroleum is located and ways of exploration it - knowing where it accumulation- the economic benefit

Learning Methods

1- Using the presentation in the explanation and clarification of graphics, pictures, tables and educational videos
2- Applying the practical part by using exercises and maps
3- Presentation of special case studies from the oil fields in Iraq
4- Student participation through discussion and presentation

Evaluating Methods

1- Laboratory reports, practical exercises, arithmetic problems and maps
2-Monthly exams (1st and 2nd month)
3- Final exams (practical and theoretical)

C- Emotional and evolutional goals

1. The ability to identify the importance of oil sources and the role of the geologist in oil.
2.Linking oil exploration with economic costs and using the best methods for oil exploration

Learning Methods

1-Giving lectures. 2- Powerpoint presentation and documentaries 3- Solve arithmetic problems and apply practical work with mapping and learn oil programs
d- General qualification skills transferred (other skills related to employability and personality development) 1. Developing the mental abilities of the studentnd skill abilities of the student 2. Monitoring and evaluating oil wells for oil production and identifying potential risks

1. Sequencing of course content

Week	Hours	Unit name	Course Outcomes	Learning method	Evaluation method
1 st and 2ed weeks	**2 h. lect. 2h. lab.**	Theoretical: Introduction to petroleum geology, oil well drilling and drilling rag components in drilling oil wells Practical: Determining the lag time	To familiarize the student with the basic concepts of petroleum geology	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
3ed week	**2 h. lect. 2h. lab.**	Theoretical: The origin and formation of petroleum practical: Calculation of heat flow	The student should understand the theories and hypotheses of the formation of oil and the petroleum system.	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
4 th week,	**2 h. lect. 2h. lab.**	Theoretical: Stages of maturation of organic matter and the formation of petroleum Practical: Calculation of pressures in geological formations	The student should have the ability to explain how oil is created and the stages of its formation from organic materials to the production of hydrocarbons.	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
5 th	**2 h. lect. 2h. lab.**	Theoretical: Geochemistry of petroleum Practical: Representation of the chemical composition of oil and its classification by categories	Knowing the chemical composition of oils	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**

6th week	**2 h. lect. 2h. lab**	Theoretical: The physical properties of the oil Practical: Determination of the physical properties of a sample of oils	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
7 th week,		First monthly exam			
8th week	**2 h. lect. 2h. lab.**	Theoretical: Petroleum Source Rocks Characterization Practical : Calculating specifications for oil-generating rocks and determining their capacity, maturity and type of kerogen in the samples	The student will be able to evaluate the source rocks in several ways	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
9 th and 10th weeks	**2 h. lect. 2h. lab.**	Theoretical: Oil migration, Practical : Calculation of oil reserves by volumetric method 1	Knowing the types of migration, its paths and mechanisms	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
11 th week	**2 h. lect. 2h. lab**	Theoretical: oil reservoirs1 Practical : Calculation of oil reserves by volumetric method 2	The student should have the ability to evaluate the properties of oil reservoirs	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
12th week	**2 h. lect. 2h. lab**	Theoretical: oil reservoirs2 Practical : Interpretation map of the source rocks	That the student have an idea of determining the properties of the reservoir. The student knows the methods of calculating the	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**

			properties of the reservoir (porosity, permeability and saturation)		
13 th week	**2 h. lect.** **2h. lab**	Theoretical: Cap rocks and traps Practical: drawing a map of the oil capacity of one of the oil fields	The student should be familiar with the type of traps, the type of cap rocks and its efficiency	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
14 th week	**2 h. lect.** **2h. lab**	Theoretical: sedimentary basins Practical: Determining the type of trap for an oil field	That the student have the ability to explain the sedimentary basins in Iraq and the Arabian Gulf	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
15th week	**2 h. lect.** **2h. lab**	Theoretical: Oil fields in Iraq Practical: semester exam	The student's understanding of the geological formations containing oil in Iraq and the reasons for the abundance of oil in the Middle East	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**

11. Infrastructure	
1- Textbooks required for the course	
2 References	-Elements of Petroleum Geology, New York 2nd ,.Selley, R.C -Petroleum Development Geology , Tulsa, Oklahoma Dickey, P.A., 1981 -Petroleum Formation and Occurrence, New York 3th Tissot, B.P., and Welte - Petroleum geology and geochemistry (Khaled Banat)
Recommended readings	
Electronic website	

12. Course Development Plan
Course development based on recent versions of books and references.. And the adoption of modern interactive teaching methods. And work to activate the field work to the oil companies Conducting an exchange of experiences with oil companies and training students on modern programs