

## Third Stage/ Oil Reservoir G308

### Course Description Form

**The course provides an opportunity for students to learn how to study oil reservoir and calculate their properties of oil reservoir in and in practice.**

1. Educational Institution	College of Science/ University of Basrah
2. Department	Geology
3. Course name/Code 1. Programs included in it	Oil Reservoir G308
4. Programs included in	Bachelor's, Master's, Doctorate
5. Attendance Form Available	Weekly
6. Semester/ Year	2020-2019
7. Total of study hours	30 hours + 30 practical hours
8. The course description was	prepared in 1/8/2020
9. Aims of the Course	
Ability of student to calculate an oil reservoir properties and diagnose of flow units in the reservoir.	

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

**a- Knowledge and Understanding goals**

- 1- Identify on the petrophysical properties of the rocks.
- 2- Identify the properties of fluids.
- 3- Study the relationship between pressure, volume and temperature in reservoir condition.
- 4- Learning how to use equations in reservoir calculation.
- 5- Learning how can use software.

**b- Subjective- Specific Skills**

- 1- Acquiring proficiency in petrophysical computation.
- 2- Gain skills to use equation and software.

**Learning Methods**

1. Explanation and Discussion of the Lectures
2. It is boosting the student to conduct research and reports.

**Evaluating Methods**

- 1- Daily test and reports
- 2- Monthly exams
- 2- Final exams

**C- Emotional and evolutional goals**

- 1- Being able to understand the importance of characterizing the properties of reservoir rock.
- 2- Identification of the properties of reservoir fluids.

**Learning Methods**

1. Explanation and Discussion of the Lectures
2. Boosting the student to conduct research and reports.
3. The student PowerPoint presentations.

d- General qualification skills transferred (other skills related to employability and personality development)

1. Developing the mental abilities of the student
2. Developing the skills

## 1. Sequencing of course content

Week	Hours	Unit name	Course Outcomes	Learning method	Evaluation method
1 st week,	2 h. lect. 2h. lab.	<b>Theoretical:</b> introduction <b>Practical:</b> Description and analysis of the core.	Knowledge and understanding of lectures	Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory	<b>Daily and monthly tests</b>
2ed,	2 h. lect. 2h. lab.	<b>Theoretical:</b> Porosity <b>practical:</b> The methods of calculating porosity in the lab.	Knowledge and understanding of lectures	Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory	<b>Daily and monthly tests</b>
3ed	2 h. lect. 2h. lab.	<b>Theoretical:</b> Absolute permeability <b>Practical:</b> The methods of calculating Absolute permeability in the lab.	Knowledge and understanding of lectures	Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory	<b>Daily and monthly tests</b>
4 th week,	2 h. lect.  2h. lab.	<b>Theoretical:</b> Factors affecting on porosity and permeability <b>Practical:</b> The methods of calculating effective permeability in the lab.	Knowledge and understanding of lectures	Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory	<b>Daily and monthly tests</b>
5 th week	2 h. lect. 2h. lab.	<b>Theoretical:</b> effective and relative permeability <b>Practical:</b> Pressure-Temperature Diagram	Knowledge and understanding of lectures	Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory	<b>Daily and monthly tests</b>

6 <sup>th</sup> week	2 h. lect. 2h. lab.	<b>Theoretical:</b> Weighted-Average of Porosity, Permeability, and water saturation. <b>Practical:</b> Determination of saturation exponent (n)	Knowledge and understanding of lectures	Understand the evolving state of knowledge learn to carry out practical work, in the field and in the	Daily and monthly tests
7 <sup>th</sup> week,	2 h. lect. 2h. lab.	<b>Theoretical:</b> wettability, surface tension and capillary pressure <b>Practical</b> The methods of calculating capillary pressure in the lab.		Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory	Daily and monthly tests
8 <sup>th</sup> week	2 h. lect. 2h. lab.	<b>Theoretical:</b> Hysteresis effects in relative permeability and Klinkenberg effect <b>Practical</b> The methods of calculating flow unit		Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory	Daily and monthly tests
9 <sup>th</sup> week	2 h. lect. 2h. lab.	<b>Theoretical:</b> exam <b>Practical</b> exam		Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory	Daily and monthly tests
10 <sup>th</sup> week	2 h. lect. 2h. lab.	<b>Theoretical</b> Fundamentals of reservoir fluid flow <b>Practical</b> <b>Pressure-Volume-Temperature Data</b>		Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory	Daily and monthly tests
11 <sup>th</sup> week	2 h. lect. 2h. lab.	<b>Theoretical:</b> Linear flow of incompressible fluids		Understand the evolving state of knowledge learn to carry out practical	Daily and monthly tests

		<b>Practical</b> <b>Saturation pressure</b>		work, in the field and in the laboratory	
12 <sup>th</sup> week	2 h. lect. 2h. lab.	<b>Theoretical</b> Linear flow of slightly compressible fluids <b>Practical</b> <b>The Compressibility Factor</b>		Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory	<b>Daily and monthly tests</b>
13 <sup>th</sup> week	2 h. lect. 2h. lab.	<b>Theoretical:</b> Radial flow of incompressible fluids <b>Practical</b> <b>The gas-formation volume factor</b>		Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory	<b>Daily and monthly tests</b>
14 <sup>th</sup> week	2 h. lect. 2h. lab.	<b>Theoretical:</b> Radial flow of Slightly compressible fluids <b>Practical</b> <b>Gas Solubility</b>		Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory	<b>Daily and monthly tests</b>
15 <sup>th</sup> weeks	2 h. lect. 2h. lab.	<b>Theoretical:</b> Multiphase flow <b>Practical :</b> <b>The Oil-Formation Factor</b>	Knowledge and understanding of lectures	Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory	<b>Daily and monthly tests</b>

**11. Infrastructure**

<b>11. Infrastructure</b>	
<b>1- Textbooks required for the course</b>	Oil reservoir
<b>2 References</b>	Tarek Ahmed-Reservoir-Engineering-Handbook
Recommended readings	Recent scientific sources
Electronic website	

## 12. Course Development Plan

Course development based on recent versions of books and references..  
The adoption of modern interactive teaching methods.  
Activating alignment programs with international universities to learn about modern curricula and to exchange the experiences.