

## Faculty of Engineering & Technology

### Petroleum Reservoir Engineering

#### Information :

**Course Code :** PE 303

**Level :** Undergraduate

**Course Hours :** 3.00- Hours

**Department :** Department of Petroleum Engineering

#### Instructor Information :

Title	Name	Office hours
Lecturer	Omar Saad Ahmed Mahmoud	8
Lecturer	Omar Saad Ahmed Mahmoud	8
Assistant Lecturer	MOAMEN AHMED GASSER HASSAN KAMEL IBRAHIM KAMEL	
Teaching Assistant	Mohamed Osama Mohamed Abbas	
Teaching Assistant	AHMED NAGUIB ABDELAZIZ ABDELAZIZ GHONIM	

#### Area Of Study :

- Acquire knowledge of the basic properties of reservoir fluids.
- Integrate knowledge of the basic reservoir rock properties.
- Evaluate hydrocarbons initially in place using volumetric method.
- Evaluate the reservoir dynamics by Darcy's law and the mechanics of single and multiphase fluid flow through reservoir rock.
- Define reservoir drive mechanisms for both oil and gas reservoirs
- Use material balance for reservoir engineering calculations

#### Description :

Properties of reservoir formations and fluids; reservoir volumetrics, reservoir statics, reservoir dynamics. Darcy's law and the mechanics of single and multiphase fluid flow through reservoir rock, capillary phenomena, material balance, reservoir drive mechanisms.

#### Course outcomes :

##### a. Knowledge and Understanding: :

1 -	Review mathematics to determine the reservoir fluid properties.
2 -	Describe reservoir properties for reservoir volume calculations.
3 -	Utilize the methodologies of solving reservoir engineering problems
4 -	Develop the current Petroleum reservoir engineering technologies.

##### b. Intellectual Skills: :

1 -	Design case studies of reservoir volumes/reserves in oil and gas reservoirs Identify maps and reservoir traps
2 -	Select appropriate solutions for reservoir engineering problems.
3 -	Design computer programs for petroleum reservoir engineering applications.

### c. Professional and Practical Skills: :

1 -	Apply knowledge of mathematics of the original oil in place determination.
2 -	Deal with the high level of uncertainty of reservoir engineering data.
3 -	Prepare technical petroleum reservoir reports.

### d. General and Transferable Skills: :

1 -	Collaborate effectively within reservoir teams.
2 -	Communicate effectively with reservoir teams.
3 -	Effectively manage tasks, time, and resources of reservoir sections.

### Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Basics of Reservoir oil properties (Oil PVT)	9	6	3
Basics of Reservoir gas properties (Gas PVT)	9	6	3
Routine (conventional) Reservoir Rock Properties	9	6	3
Special (Advanced) Reservoir Rock Properties	12	6	6
Volumetric method of OOIP calculation.	6	3	3
Reservoir Drive Mechanisms and their Characteristics	6	3	3
Material Balance Equation (MBE) of OOIP Calculation	9	6	3
Fluid flow in reservoir porous media	9	6	3
Diffusivity equation	6	3	3

### Teaching And Learning Methodologies :

Interactive Lecturing
Discussion
Problem-based Learning

### Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Assignments	15.00	9	
Final Exam	40.00		
Mid- Exam	25.00	1	
Participation	10.00	15	
Quizzes	10.00	7	

### Recommended books :

Tarek Ahmed: %Reservoir Engineering Handbook+4th Edition, Gulf Professional Publishing; 4 edition (January 26, 2010).  
Reservoir Engineering Handbook, 3rd Edition, Tarek Ahmed, Gulf Professional Publishing, 2006, ISBN 0-7506-7972-7.  
Applied Petroleum Reservoir Engineering, 2nd Edition, B.C. Craft and M.F. Hawkins, Revised by R. Terry, Prentice Hall PTR, 1991, ISBN 0-13-039884-5.  
Fundamentals of Reservoir Engineering, L.P. Dake, Elsevier Science B.V., 1998, ISBN 0-444-41830-X.