

Faculty of Engineering & Technology

Mechnical Earth Modeling

Information :

Course Code :	PE 502	Level	:	Undergraduate	Course Hours :	3.00- Hours

Department : Department of Petroleum Engineering

Instructor Information :

Title	Name	Office hours
Associate Professor	Ashraf Fahmy Mohamed Ismael	13
Assistant Lecturer	YOUSSEF ELSAYED ABDELHAFEZ KANDIEL	

Area Of Study :

1- Familiarize students with development of the Mechanical Earth Model's principle

components (MEM), formation in-situ stress and strength.

2- Train students for 1-D modeling methods, 3-D extension and the integration of MEM with well design.

3- Develop students of skills to create MEM model and compare to actual field results.

Description :

Development of the Mechanical Earth Model's principle components(MEM), formation in-situ stress and strength. 1-D modeling methods are reviewed and extended to 3-D; and the integration of MEM with well design is shown. An MEM model will be created and compared to actual field results.

Course outcomes :

a.Knowled	ge and Understanding: :		
1 -	Describe Mechanical Earth Model's principle components (MEM).		
2 -	Explain the integration of MEM with well design.		
3 -	Demonstrate the methodologies of solving engineering problems and data collection.		
b.Intellectu	al Skills: :		
1 -	Apply appropriate solutions for MEM problems based on analytical thinking and data collection		
2 -	Think in a creative and innovative way in problem solving and design.		
c.Professio	onal and Practical Skills: :		
1 -	Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to create MEM model.		
2 -	Professionally merge the engineering knowledge, understanding, collected data and feedback to make the integration of MEM with well design is shown.		
3 -	Prepare technical report and assignments.		
d.General and Transferable Skills: :			

Ability to work in a team.
Ability to share ideas and communicate with others



3 -

Ability to deal with others according to the rules of professional ethics.

Course Topic And Contents :			
Торіс	No. of hours	Lecture	Tutorial / Practical
The rock models	5	3	2
Mechanical earth model(MEM)	10	6	4
Development of 3D modelling techniques	10	6	4
Static reservoir models	10	6	4
Modelling the Structure of the Earth	10	6	4
Land Surface Models and Surface Water Hydrology	10	6	4
Reservoir Simulation	10	6	4
Geo-mechanical model	10	6	4

Teaching And Learning Methodologies :		
Interactive Lecturing		
Discussion		
Problem solving		

Course Assessment :			
Methods of assessment	Relative weight %	Week No	Assess What
Attendance	5.00		
Final examination	40.00		
Homework assignments	15.00		
Mid-term examination	30.00		
Quizzes	10.00		

Recommended books :

*Petroleum Related Rock Mechanics *Fundamentals of Rock Mechanics.

Periodicals :	
onepetro	

Web Sites :

www.spe.org