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	7
Lecturer	Salah Ahmed Ebrahem Badr	2
Assistant Lecturer	YOUSSEF ELSAYED ABDELHAFEZ KANDIEL	
Teaching Assistant	Mohamed Osama Mohamed Abbas	
Teaching Assistant	Abdelrahman Adel Abdullah Abdelghany Kandil	

Area Of Study :

Familiarize with development of the Mechanical Earth Model's principle components (MEM), formation in-situ stress and strength.
Train for 1-D modeling methods, 3-D extension and the integration of MEM with well design.
Develop 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.Knowledge and Understanding: :	
1 -	Describe Mechanical Earth Model's principle components (MEM).
2 -	Explain the integration of MEM with well design.
3 -	Illustrate the methodologies of solving engineering problems and data collection.
b.Intellectual Skills: :	
1 -	Demonstrate appropriate solutions for MEM problems based on analytical thinking and data collection.
2 -	Think in a creative and innovative way in rock mechanics problem solving and design.
c.Professional 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: :	
1 -	Work in a team.
2 -	Share ideas and communicate with others
3 -	Deal with others according to the rules of professional ethics.

Course Topic And Contents :

Topic	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
Assignment	15.00		
Final Exam	40.00		
Mid- Exam	25.00		
Participation	10.00		
Quizzes	10.00		

Recommended books :

*Petroleum Related Rock Mechanics
*Fundamentals of Rock Mechanics.