FUTURE UNIVERSITY IN EGYPT جامعة المستقبل

Faculty of Engineering & Technology

Structural Geology

Information :

Course Code :	GEO 301	**Level :**	Undergraduate	**Course Hours :**	2.00- Hours

Department : Department of Petroleum Engineering

Instructor Information :

Title	Name	Office hours
Lecturer	Mostafa Abdou Roshdy Ahmed Teama	3
Lecturer	Mostafa Abdou Roshdy Ahmed Teama	3
Assistant Lecturer	YOUSSEF ELSAYED ABDELHAFEZ KANDIEL	
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Description :

This course examines the fundamental concepts of deformation of the lithosphere. Due to the mobile nature of the Earthôs lithosphere, rocks are invariably deformed, showing evidence of the effects of large stresses at all scales, from submicroscopic to regional. A long geologic history on Earth has resulted in many regions showing the cumulative effects of multiple deformation events. It is therefore important to be able to distinguish different geologic structures, describe them fully, understand how they formed, and place them in the context of a broader geologic history. There are few aspects of geology that are not directly impacted by the effects of deformation. This course will provide you with a framework to integrate an understanding of structural geology into all aspects of geologic study.

Course outcomes :

a.Knowledge and Understanding: :	
1 -	Measure the orientation of planar and linear structures with a Brunton compass.
2 -	Identify the probable type of stress that created a structure.
b.Intellectual Skills: :	
1 -	Recognize different types of "tops-up" indicators.
2 -	Recognize different types of faults and folds.
c.Professional and Practical Skills: :	
1 -	Determine sense-of-shear of some rocks.
2 -	Construct geologic cross-sections.
d.General and Transferable Skills: :	
1 -	Solve 3-point problems to determine subsurface strike and dip.
2 -	Use stereonets to determine structural information.

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Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Introduction to structural geology	2	Introduction	
Stress,Strain and Rheology	6	Explaining the structural geology techniques	Discussion os assignments and weekly work sheets
Brittle deformation	4	As above mentioned	As above mentioned
Ductile deformation	4	As above mentioned	As above mentioned
faults	6	As above mentioned	As above mentioned
Subsurface mapping	2	As above mentioned	As above mentioned
Kinematic analysis	2	As above mentioned	As above mentioned
Structures in Petroleum exploration	2	As above mentioned	As above mentioned

Teaching And Learning Methodologies :

Weekly oral lectures using white board

Power Point presentations using data show

Displaying animated short videos

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Assignments and reports	10.00	1	
Final Exam	40.00	15	
Quizzes	10.00	5	
Weekly tutorials and attendance	10.00	1	

Course Notes :

PDF files available direct after lectures

Recommended books :

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1) Park, R. G., Foundations of Structural Geology, 2nd Edition. Blackie, USA: Chapman and Hall, New York, 148 p, 1989.
2) Hatcher, R. D., Structural Geology, Principles, Concepts and Problems. Merill Publishing Company, Columbus, 1995, 525p.
3) Hatcher, R. D., and Hopper, R. J., Laboratory Manual for Structural Geology. Macmillan Publishing Company, New York, 1990, 217p.
4) Hobbs, Means, and Williams, An Outline of Structural Geology, John Wiley and Sons, Inc., New York, 1976.
5) Marshak, S. and Mitra, G., Basic Methods of Structural Geology, Prentice Hall, Inc., Englewood Cliffs, New Jersey, 1988.
6) Suppe, J., The Principles of Structural Geology, Prentice-Hall, Inc., New Jersey, 1985.
7) Ragan, D. M., Structural Geology, An Introduction to Geometric Techniques, Third Edition, John Wiley and Sons.
8) Ramsay, J. G., Folding and Fracturing of Rocks, McGraw-Hill Book Company, New York, 1967, 568p.
9) Ramsay J. G., and Huber, M. I., The Techniques of Modern Structural Geology, Volume 1: Strain Analysis, Academic Press, New York, 1983.
10) Ramsay J. G., and Huber, M. I., The Techniques of Modern Structural Geology, Volume 2: Folds and Fractures, Academic Press, New York, 1983.
11) Means, W.D., Stress and Strain, Basic Concepts of Continuum Mechanics for Geologists, Springer Verlag, New York, 1976.

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