



مركز الاعتماد
وإضمان الجودة
ACCREDITATION & QUALITY ASSURANCE CENTER



The University of Jordan

Accreditation & Quality Assurance Center

COURSE Syllabus

**Course Name: Structural
Geology 0305341**

1	Course title	Structural Geology
2	Course number	0305341
3	Credit hours (theory, practical)	3 hour practical
	Contact hours (theory, practical)	2 hours theory, 40 hours practical
4	Prerequisites/corequisites	General Geology 0305101, first year math, physics, and chemistry, structural geology, rocks, historical geology...
5	Program title	Environmental and Applied Geology
6	Program code	
7	Awarding institution	The University of Jordan
8	Faculty	Faculty of Science
9	Department	Geology
10	Level of course	undergraduate
11	Year of study and semester (s)	2016-2017 sem.2
12	Final Qualification	
13	Other department (s) involved in teaching the course	
14	Language of Instruction	English
15	Date of production/revision	April 2017

Academic standards

Structural Geology is the study of geological structures including folding, faulting and jointing. Our understanding of structural geology is developed by adopting the scientific method whereby data is collected by observation and used to formulate and test hypotheses. It depends on scientists being objective and sharing all their data, methods and ideas with their peers, by publishing their findings. This allows other scientists to further analyse and build on this body of knowledge by which we learn about structural Geology. Professional scientists must always acknowledge their sources. **Plagiarism** is the presentation of thought or work of another person as though it is one's own without proper acknowledgment. The University's regulations make it clear that plagiarising is a breach of student discipline and may incur a range of penalties.

16. Course Coordinator: Dr. Fathi Shaqour

Office numbers:

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17. Values/Attitudes

- Appreciate the role and importance of Field Geology in understanding the distribution of rocks on Earth surface and the relationships between the different rock types and rock structures to represent them on maps and be able to interpret the geological maps.
- Conduct of professional standards.

18. Course Description:

Study of the application of deforming forces to earth materials and the structures resulting from that deformation. Overview of the different types of force that influence materials in general and Earth materials in specific mainly rocks; stress and strain relationships with the geometry and genesis of geological structures: jointing, faulting and folding. Use of statistical approaches to represent geological structures such as rose diagrams and stereo-nets.

19. Course aims and outcomes:

The **primary goal** of this course is to provide students with the opportunity to learn and apply these skills that are fundamental to the discipline of Geology. By the end of this course, you will be able to:

- Collect and record data using common geologic field methods and tools;
- Synthesize geologic data you've collected in the field by producing geologic maps and cross-sections;
- Develop a reasonable geologic history based on multiple lines of evidence.

These are not the only goals we have, however, because we could do that without ever leaving the university. Our **additional goals** are to:

- Expose you to a spectacular environment, where several different geologic processes are present and well-exposed;
- Build a community of undergraduates who are interested in and excited about geology.

In order to achieve all of these goals, we will travel to different parts of Jordan where excellent outcrops are available.

A- Aims:

Main aims of the course are the following:

- 1) To review directions and trends: lineaments, planes and surfaces, and block diagrams.
- 2) To understand the principles of type of stresses and related deformations on rocks.
- 3) To learn the geometry and genesis of geological structures: jointing, faulting and folding.
- 4) To train students on how to correctly measure bearing, strike and dip using Brinton compass
- 5) To train students on how to read and interpret topographic, geological, geological structures and cross-sections.
- 6) To train students on some statistical representations of geological structures i.e. rose diagrams
- 7) To teach and train students about stereographic projections and their applications to structures
- 8) To learn theory and applied aspects of structural geology.
- 9) To gain appreciation to the importance of understanding the geological structures and their applications.
- 10) To prepare geology students to function as important contributors to applied geology work.

B- Intended Learning Outcomes (ILOs):

Upon successful completion of this course students will be able to:

- Demonstrate an understanding of the terms, concepts and principles of structural geology,
- Demonstrate an understanding of the Earth plate tectonics and their role of deforming the rocks in the forms of folding, faulting and jointing,
- Develop professional skills in structural geology, such as measuring strike and dip using geological compass, identifying geological structures in nature and on maps,
- Develop understanding of rock structures and how to geometrically describe structures and analyse them genetically.
- Read and interpret geological structures on geological maps
- Use stereographic projections to represent inclined planes and their dip directions for the purpose of analysing geological structures.

20. Outline and Schedule:

Week	Topic
1	1- Introduction and basic concepts: stress and strain 2- Stress and strain in materials and deformation in rocks 3- Ductile and brittle behaviour of rock materials
2	4- Bearing and Azimuth 5- Attitudes of lines and planes and attitudes of geological surfaces (bearing and plunge), strike and dip, outcrops of inclined layers and folded beds
3	6- Relationship between outcrops/geological contacts with erosion/ topography/ contour lines 7- Geological contacts / contour lines of horizontal layers
4	8- Review of topographic features and outcrops of horizontal layers. 9- Geological contacts / contour lines of inclined layers 10- Study and analysis of geological maps
5	11- First Exam Folds: 12- basic fold geometry and nomenclature
7	Folds (continue) 13- fold orientation and classification 14- fold mechanism and fold geometry 15- fold types
8	16- Domes and basins 17- Outcrop patterns of dome and basin structures 18- Map analysis of folded rocks
9	19- Field trip 20- Discussion of field trip features and analysis of the geological map of the visited area/structures
10	Faults 21- fault geometry fault types
11	Faults (continue) 22- outcrops of faulted strata 23- relationship between folds and faults 24- Second Exam
12	25- Joints and fractures
13	26- Stereographic projections 27- Representations of planes on stereo-nets
14	28- Further examples of stereo net analysis

21. Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:

This course emphasizes the quantitative problem solving to gain a better understanding of geological materials and processes. Therefore, the student will be trained on that through independent and guided solution of problem sets that cover the various and most important aspects covered in the lecture.

22. Evaluation Methods and Course Requirements:

First Test	20%	Week 5	Assess a student's understanding, knowledge and competency of theoretical concepts and practical aspects of the course material. Requirement: Set a written exam on the entire content of the course Assessment Criteria: Correct answers, demonstration of understanding of concepts and principles
Mid-term Test	25%	Week 11	
Final Exam	40%	(Exam period)	
Practical test and reports	15%	During semester	
Total	100%		

Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:

Discussion in the class, quizzes, quantitative problem solving and two term and final exams

23. Course Policies:

A- Attendance policies: The rules of the University apply
 B- Absences from exams and handing in assignments on time:
 Assignments must be handed in on time.
 C- Health and safety procedures:
 D- Honesty policy regarding cheating, plagiarism, misbehavior:
 The regulations of the University of Jordan are applicable
 E- Grading policy: The final grade is based on the overall performance of the student to be deduced from
 Interest in class through interaction; participation in quizzes, problem set solving and exams:
 Below is a tentative grading scale
 A: 90-100
 A-: 85-89
 B+: 80-84
 B: 75-79
 B-: 70-74
 C+: 65-69
 C: 60-64
 C-: 55-59
 D+: 50-54
 D: 49-45
 D-: 40-44
 F: 0-39

24. Required equipment:

1. Laptop; data show and white board and whiteboard marker
2. Straight edge ruler with millimetre divisions, transparent protractor, preferably a small one with radial lines.
3. Compass to draw circle (e.g., Mohr circle).
4. Graph paper with mm & cm divisions; do not buy those in inches.
5. Equal area net (to be provided); need to be mounted on a card board.
6. Thin (0.5 mm) mechanical pen with HB lead; Eraser
7. Colored pencils (very useful for maps!).
8. Programmable calculator, with trigonometric and logarithm functions and memory (optional)
9. Brunton Compass (can be shared by students)
10. Highlighting pens (to color map exercises); will be of great help to highlight rock units on maps.

25. References:

- 1) Structural Geology by Ben A. Van Der Pluijm and Stephen Marshak, 2nd edition
- 2) Structural Geology by Haakon Fossen, 2016, 2nd edition

Name of Course Coordinator: -----Signature: ----- Date: -----

Head of curriculum committee/Department: ----- Signature: -----

Head of Department: ----- Signature: -----

Head of curriculum committee/Faculty: ----- Signature: -----

Dean: -----Signature: -----

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