



مركز الاعتماد  
وإضمان الجودة  
ACCREDITATION & QUALITY ASSURANCE CENTER



**The University of Jordan**

**Accreditation & Quality Assurance Center**

**COURSE Syllabus**

**Course Name:**

**Engineering Geology**

**0345391**

1	Course title	<b>Engineering Geology</b>
2	Course number	<b>0345391</b>
3	<b>Credit hours (theory, practical)</b>	<b>3 hours theory;</b>
	<b>Contact hours (theory, practical)</b>	<b>3 hours theory,</b>
4	Prerequisites/corequisites	<b>General Geology 0305101, Structural Geology 0305341, first year math, physics, and chemistry</b>
5	Program title	<b>Environmental and Applied Geology</b>
6	Program code	
7	Awarding institution	<b>The University of Jordan</b>
8	Faculty	<b>Faculty of Science</b>
9	Department	<b>Geology</b>
10	Level of course	<b>undergraduate</b>
11	Year of study and semester (s)	<b>2016-2017 Fall</b>
12	Final Qualification	
13	Other department (s) involved in teaching the course	
14	Language of Instruction	<b>English</b>
15	Date of production/revision	<b>April 2017</b>

### Academic standards

Engineering Geology is a science discipline. Our understanding of engineering geology is developed by adopting the scientific method whereby data is collected by investigation or 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 Engineering 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, office hours, phone numbers, and email addresses should be listed.

Sunday, Tuesday, and Thursday 11:00-12:00

f.shaqour@ju.edu.jo

00962798100473

**17. Values/Attitudes**

- Appreciate the role and importance of Geology in civil engineering.
- Conduct of professional standards.

**18. Course Description:**

Overview of the physical and engineering properties of soils and rocks; index geotechnical properties of rocks and soils: density, unit weight, porosity, void ratio, Atterburg limits of soils, relative density, and shear strength of soils and rocks; engineering soil and rock classification systems; natural hazards and their engineering significance; and slope stability. Mechanics of Earth materials and how they respond to forces and stresses, exploring in more physical detail the mechanics of rock, soils, and fluids, and how these relate to site vulnerabilities

**19. Course aims and outcomes:****A- Aims:**

Main aims of the course are the following:

- 1- To learn the basics of engineering geology,
- 2- To learn the index geotechnical properties of soils and rocks,
- 3- To gain knowledge of the engineering properties of rock types,
- 4- To learn engineering concepts of geological hazards (earthquakes, subsidence, coastal processes) and incorporate them in the engineering designs.
- 5- To gain appreciation to the importance of the geological factors in engineering designs.

**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 engineering geology,
- Demonstrate an understanding of the Earth processes (earthquakes, volcanic activity, erosion and mass wasting) and their influence on the design of civil engineering projects.
- Develop professional skills in engineering geology,
- Develop understanding of rock types and engineering classifications of soils and rocks.
- Be aware of the role of geology in civil engineering design, construction and maintenance,
- Apply engineering principles on earth materials,

## 20. Outline and Schedule:

Week	Topic
1	1- Introduction: discuss the syllabus, why study the course, General information 2- The basics of engineering geology, its relationship with other disciplines especially civil engineering, terminology, the role of engineering geologist. 3- Composition of Earth, plate tectonics, rock types with touches of engineering aspects
2	4- Rock types: classification, properties and identification 5- Classification and properties of igneous rocks with engineering flavour 6- Classification and properties of sedimentary rocks and metamorphic rocks with engineering flavour and spices
3	7- Engineering Soil: Types of soil and soil description, 8- Engineering properties of soils: grain size, Atterberg limits with special emphasis on expansive soils and soil classification
4	9- Engineering properties of soils: strength properties 10- Soil strength testing: direct shear, 11- Soil strength testing: uniaxial compressive strength,
5	12- Soil strength testing: tri-axial compressive testing 13- Discussions and problem solving on the engineering properties of soils 14- <b>First Exam</b>
7	15- Index engineering properties of rocks 16- Engineering properties of sedimentary rocks with emphasis on folds, faults and joints 17- Engineering properties of igneous and metamorphic rocks 18- Engineering classification of rocks -a
8	19- Engineering classification of rocks -b 20- Construction Uses of rocks and soils: Aggregates 21- Construction Uses of rocks and soils: Aggregates (continue) 22- Riprap and other large rock materials
9	23- Engineering Geology and Earth processes: Safety, risk and geologic forecasting including earthquakes and volcanoes 24- Landslides; types, causes and instability problems 25- Land subsidence and subsurface openings, expansive soils and shorelines processes
10	26- Site Investigation: Maps; topographic maps and features, 27- Remote sensing; satellite images and aerial photographs 28- Geological maps and cross sections; elements, map reading and interpretations
11	29- <b>Second Exam</b> 30- Site Investigation: Geophysical methods; 31- Drilling; types of drilling and sampling (disturbed and undisturbed)
12	32- Site Investigation: (continue); laboratory testing 33- Site Investigation: (continue); field testing; SPT, CPT, DCPT, 34- Test data interpretations
13	35- Subsurface water: Occurrence of subsurface water, aquifers and aquitards, types of aquifers and groundwater movement 36- Subsurface Water: Engineering significance and influence, 37- Control of subsurface water: Barriers and liners, Dewatering, Drains & wells
14	38- Engineering Geologic maps Revision and applications, Engineering Geologic maps and Case histories

**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. <b>Requirement:</b> Set a written exam on the entire content of the course <b>Assessment Criteria:</b> Correct answers, demonstration of understanding of concepts and principles
Mid-term Test	30%	Week 11	
Final Exam	50%	(Exam period)	
<b>Total</b>	<b>100%</b>		

**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 midterm and a final exam**

**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

F- Available university services that support achievement in the course:

**24. Required equipment:**

Laptop; data show and white board and whiteboard marker

**25. References:**

1) Principles of Engineering Geology, Robert B. Johnson and J.V.DeGraff, 1988 John Wiley (available in book shop); 2) *Engineering Geology*, Richard E. Goodman, John Wiley 1993; Check UJ library and Google books for other references. <http://books.google.com.au/books>

**26. Additional information:**

Engineering Geology Journals:  
Quaternary Journal of Engineering Geology  
Bulletin of Engineering Geology

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

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

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

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

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

Copy to:  
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Course File