



Course Syllabus
According to JORDAN National Qualification
Framework (JNQF)

Course Name: Engineering Geology

Course Number: 4032122

General Course Information:

Course title	Engineering Geology
Course number	4032122
Credit hours	3Hrs Theory
Education type	[Online (Synchronous, Asynchronous)], [Hybrid (Face-to-Face, Online (Synchronous, Asynchronous)), OR [Face-to-Face]
Prerequisites/corequisites	
Academic Program	Civil Engineering
Program code	40
Faculty	Engineering
Department	Civil Engineering
Level of course	Second Year
Academic year /semester	1 st Semester 2022-2023
Awarded qualification	B.Sc
Other department(s) involved in teaching the course	-
Language of instruction	English
Date of production/revision	-

Course Coordinator:

Coordinator's name	Prof. Dr. Saad Alabdullah
Office No	3411
Office Phone extension number	2452
Office Hours	
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Other Instructors:

Instructor name	Prof. Dr. Saad Alabdullah
Office No	3411
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Course Description (English/Arabic):

English	Engineering Geology is the application of geology to obtain information and understanding of geological structures, materials and processes, as needed for engineering analysis and design. Geological Engineering is the application of a combination of geology and engineering science to design, involving rock, soil, groundwater and mineral resources. Geological engineering, a major specialty area within civil engineering, focuses on how
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	soil and rock support and affect the performance of structures built on or below the earth's surface.
Arabic	الجيولوجيا الهندسية هي تطبيق الجيولوجيا للحصول على معلومات وفهم الهياكل والمواد والعمليات الجيولوجية، حسب الحاجة للتحليل والتصميم الهندسي. الهندسة الجيولوجية هي تطبيق مزيج من علوم الجيولوجيا والهندسة للتصميم، بما في ذلك الصخور والتربة والمياه الجوفية والموارد المعدنية تركز الهندسة الجيولوجية ، وهي مجال تخصص رئيسي في الهندسة المدنية ، على كيفية دعم التربة والصخور وتأثيرها على أداء الهياكل المبنية على سطح الأرض أو تحته.

Textbook: Author(s), Title, Publisher, Edition, Year, Book website.

1. Chenna Kesavnin. 2012. Textbook of Engineering Geology.
 2. F. G. Bell. 2006. Engineering Geology.
 3. James S. Monroe and Read Wicander. 2005. Physical geology, exploration the earth. Fifth edition.
- Supplemental lecture material (e.g copies of lecture power points, study guides, handouts) will be available. Recommended reading assignments from the course textbook are indicated on the lectures schedule. It is best to read the assignment in advance of the lecture so that you are prepared with questions.

References: Author(s), Title, Publisher, Edition, Year, Book website.

1. Brain J Skinner, Stephen C. Porter and Jeffrey Park. 2004. An introduction to physical Geology. Fifth edition.
2. Basic glossary of geological terms (in English):
<http://www.geotech.org/survey/geotech/dictiona.html>

Course Educational Objectives (CEOs):

1.	Be able to predict properties and types of a rock and minerals by how it appears in hand sample/outcrop.
2.	Know how to read topographic and geologic maps.
3.	Be able to recognize all types of Natural Minerals and using Rocks as construction Materials
4.	Be able to construct topographic and geologic cross sections.
5.	Be able to identify the soil and rocks, its physical and Engineering properties.
6.	Be able to identified water resources and aquifers layers and construction materials
7.	Conduct simple site investigation and geophysical surveys

Intended Learning Outcomes (ILO's):

	Subject Intended learning outcomes (ILOs) describe what students are expected to know and be able to do at the end of the course. These outcomes are related to the knowledge, skill and competence that students acquire:	Relationship to CEOs	Contribution to PLOs	Bloom Taxonomy Levels*	Descriptors**
A	Knowledge and Understanding:				
1. A1	Demonstrate an understanding of the terms, concepts and principles of engineering geology	1	1	1&2	K
2. A2	Demonstrate an understanding of the Earth processes (earthquakes, volcanic activity, erosion and mass wasting) and their influence on the design of civil engineering projects.	2	1	1&2	K
B	Intellectual skills:				
3. B1	Review rock and soil field investigation	3	2	2&3	KS
4. B2	Use the techniques, skills and modern engineering tools for recognize all Minerals in Rocks	3	2	2&3	KSC
5. B3	Develop professional skills in engineering geology, Minerals in rocks	3	2	2&3	KSC
C	Subject specific skills:				
6. C1	Develop understanding of rock types and engineering classifications of soils and rocks	4	2	4&5	SC
7. C2	Be aware of the role of geology in civil engineering design, construction and maintenance,	5	6	4&5	SC
D	Transferable skills:				
8. D1	Solve the geological engineering problems	6	6	6	KSC

***Bloom Taxonomy Levels**

Level #	1	2	3	4	5	6
Level Name	Knowledge	Comprehension	Application	Analysis	Evaluation	Synthesis

**** Descriptor (National Qualification Framework Descriptors): K : Knowledge, S: Skill, C: Competency.**

Program Learning Outcome (PLOs):

Program Learning Outcomes describe what students are expected to know and be able to do by the time of graduation. These relate to the knowledge, skills, and behaviours that students acquire as they progress through the program. A graduate of the () program will demonstrate:		Descriptors**		
		K	S	C
1.	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	K	S	C
2.	An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	K	S	C
3.	An ability to communicate effectively with a range of audiences			
4.	An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts			
5.	An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives			
6.	An ability to develop and conduct appropriate experimentation, analyse and interpret data, and use engineering judgment to draw conclusions	K	S	C
7.	An ability to acquire and apply new knowledge as needed, using appropriate learning strategies			

**** Descriptors according to the national qualifications framework (K: knowledge, S: skill, C: Competency)**

Weekly Schedule (please choose the type of teaching)

✓ Face to Face

Week	First Lecture (S 11.00-12.00)	Second Lecture (T 11.00-12.00)	Third Lecture (TH 11.00-12.00)	Ach. ILOs	Ach. PLOs	Descriptors **
1	Introduction	The Earth	Know basic materials of earth solid rocks.	A1	1	K
2	Minerals	Minerals	Understand atoms, elements and minerals	A2	1	K
3	Rocks	Rocks	Types and classification of rocks	B1	1	KS
4	Rocks	Rocks	Understand the rock cycle, (igneous, sedimentary and metamorphic).	B2	1	KSC
5	Rocks	Rocks	Understand external geologic processes as weathering and its mechanical and chemical products including the soil formation and classification	C1	2	KSC
6	Rocks	Rocks	Understand the geological structures (faults, joints and folds	C2	2	KSC
7	Rocks	Rocks	Dips and Strike in Rocks	C3	2	KSC
8	Topographical	Topographical	Understand the geological mapping and topo maps	A1 & C1	1&2	KSC
9	Groundwater	Groundwater	Understand hydrology (surface and groundwater	B1& D1	2&6	SC
10	Geophysics	Geophysics	Physical properties of rocks	B2 & C3	2	SC
11	Physical properties	Physical properties	Physical properties of Soil	C1	2	KSC
12	Site investigation	Site investigation	Site investigation and construction materials	C1	2	KSC
13	Geophysics	Geophysics	Geophysical Techniques in evaluating the rocks and soil	C2	6	KSC
14	Earthquakes	Earthquakes	Earthquakes, geophysics and volcanoes	D1	6	KSC
15	Review	Review	Final exam	D1	6	KSC

* K: Knowledge, S: Skills, C: Competency

Teaching Methods and Assignments:

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

- ✓ Interactive videos
- Practice Labs
- ✓ Discussion Forums
- ✓ Quizzes
- ✓ Other Interactive online activities
- ✓ Reports

Course Policies:

A- Attendance policies:

The maximum allowed absences is 15% of the lectures.

B- Absences from exams and handing in assignments on time:

Midterm exam can be retaken based on approval of excuse by the instructor's discretion.

Not handing assignment on time will incur penalties.

C- Academic Health and safety procedures

D- Honesty policy regarding cheating, plagiarism, and misbehaviour:

Cheating, plagiarism, misbehaviour will result in zero grade and further disciplinary actions may be taken.

E- Grading policy:

- All homework is to be posted online through the e-learning system.
- Exams will be marked within 72 hours and the marked exam papers will be handed to the students.
- Online Activities (Course Videos, Practice labs, Discussion Forums, Quizzes) **_20%**
- Midterm **30%**
- Final Exam **50%**

F- Available university services that support achievement in the course: **E-Learning Platform, Labs, Library.**

Required equipment:

- **PC / Laptop with webcam and mic**
- **Internet Connection**
- **Access to the IU E-Learning Platform at: <https://elearn.iu.edu.jo/>**
- **E-learning plan**
- Satisfaction questionnaires for online and face-to-face learning
- Software for e-learning
- Training

Assessment Tools implemented in the course:

- ✓ Final Exam
- ✓ Midterm Exam

- ✓ Quizzes
- ✓ Homework
- Practice Labs
- ✓ Discussion Forums
- ✓ Periodic reports for learning assessment
- ✓ Improvement plans for online or face-to-face teaching
- Others:.....

Responsible Persons and their Signatures:

Course Coordinator	Prof. Dr. Saad Alabdullah	Completed Date	/ /
		Signature	
Received by (Department Head)		Received Date	/ /
		Signature	