



Course Syllabus

According to JORDAN National Qualification
Framework (JNQF)

Course Name: GEOTECHNICAL Engineering

Course Number: 4033151

General Course Information:

Course title	Geotechnical Engineering
Course number	4033151
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	Third 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	
Email	saad.alabdullah@iu.edu.jo

Other Instructors:

Instructor name	Prof. Dr. Saad Alabdullah
Office No	3411
Office Phone extension number	2452
Office Hours	
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Course Description (English/Arabic):

English	Origin and main characteristics of soil, soil in engineering, soil classification, concepts of soil compaction, seepage of water through a soil and its permeability, types of stresses transmitted to soil, types of settlements in the soil (a focus on consolidation), shear strength of soil and its applications. soil and rock support and affect the performance of structures built on or
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	below the earth's surface.
Arabic	الأصل والخصائص الرئيسية للتربة ، التربة في الهندسة ، تصنيف التربة ، مفاهيم انضغاط التربة ، تسرب المياه من خلال التربة ونفاذية التربة ، أنواع الضغوط المنقولة إلى التربة ، أنواع المستوطنات في التربة (التركيز على التوحيد) ، القص قوة التربة وتطبيقاتها.

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

1. Principles of Geotechnical Engineering, 9th Edition, B. Das, 2020.

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. Geotechnical Engineering, 1st edition, T. Ramamurthy, 2011.
2. Modern geotechnical engineering, S. Alam, 2009.
3. Soil Mechanics and Geotechnical Engineering, S. Dhananjay, 2003.
4. Basic glossary of geological terms (in English):
<http://www.geotech.org/survey/geotech/dictiona.html>

Course Educational Objectives (CEOs):

1.	Introduce students to the methods of applying the principles of soil mechanics.
2.	Be able to identify the types of soil and rocks, their physical and engineering properties..
3.	Provide an introductory understanding of soil mechanics analyses and design techniques
4.	Develop skills in solving several classical and major problems in geotechnical engineering
5.	Be able to identify the soil, its physical and Engineering properties.
6.	Be able to identified the stiffness of soil
7.	Conduct simple soil improvement

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 Geotechnical engineering	1	1	1	K
2. A2	Demonstrate an understanding of the physical and mechanical properties of Soil	2	1	1	K
B	Intellectual skills:				
3. B1	Review stress in soil and effected criteria's	3	2	2	KS
4. B2	Use the techniques, skills and modern engineering tools for recognize all consolidation theory	3	2	2	KSC
5. B3	Develop professional skills in stiffness of soil	4	2	2	KSC
C	Subject specific skills:				
6. C1	Develop understanding of soil types and engineering classifications of soils and rocks	5	2	2	SC
7. C2	Be aware of the role of geotechnical engineering in civil engineering design, construction .	6	6	2	SC
D	Transferable skills:				
8. D1	Solve the geotechnical engineering problems	7	6	3	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

We ek	First Lecture (S 11.00-12.00)	Second Lecture (T 11.00-12.00)	Third Lecture (TH 11.00-12.00)	Ach. ILOs	Ac h. PL Os	Descriptors **
1	Introduction	Physical properties	Know basic properties of soil	A1	1	K
2	Atterberg limits	Consistency limits	Understand soil consistency	A2	1	K
3	classification	classification	Types and classification of soil	B1	1	KS
4	USCS	USCS	Understand the rock cycle, (igneous, sedimentary and metamorphic).	B2	1	KSC
5	TYPE OF STRESSES	EFFECTIVE STRESS	Effect of geostatic and external stresses on behavior of soil	C1	2	KSC
6	Hydraulic Conductivity	Hydraulic Conductivity	Understand the coefficient of permeability on flow of water in soil	C2	2	KSC
7	Rocks	Rocks	Dips and Strike in Rocks	C3	2	KSC
8	Consolidation theory	Consolidation theory	Solving problems in compressibility	A1 & C1	1 & 2	KSC
9	Differential settlement in soil	Differential settlement in soil	Understand Differential settlement and consolidation theory	B1 & D1	2 & 6	SC
10	Consolidation with time	Consolidation with time	Behaviour of soil under loading	B2 & C3	2	SC
11	Consolidation with time	Consolidation properties	Evaluating of settlement	C1	2	KSC
12	Introduction in shear strength	Shear strength evaluation	Triaxial tests and its types	C1	2	KSC
13	Soil stiffness	Soil stiffness	problems in Soil stiffness	C2	6	KSC
14	UUT,CUT & CDT	Shear in site	Soil improvement	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	