Form: Course Syllabus	Form Number	EXC-01-02-02A
	Issue Number and Date	2/3/24/2022/2963 05/12/2022
	Number and Date of Revision or Modification	
	Deans Council Approval Decision Number	2/3/24/2023
	The Date of the Deans Council Approval Decision	23/01/2023
	Number of Pages	06

1.	Course Title	Advanced Engineering Geology
2.	Course Number	0335891
3.	Credit Hours (Theory, Practical)	3, theory
	Contact Hours (Theory, Practical)	3, theory
4.	Prerequisites/ Co-requisites	Geo101, Rocks, Structural Geology
5.	Program Title	PH.D in Geology
6.	Program Code	-
7.	School/ Center	School of Science
8.	Department	Geology
9.	Course Level	PH D program
10.	Year of Study and Semester (s)	2024/2025 second semester
11.	Other Department(s) Involved in Teaching the Course	-
12.	Main Learning Language	English
13.	Learning Types	✔ Face to face learning ☐Blended ☐Fully online
14.	Online Platforms(s)	✔ Moodle ✔ Microsoft Teams
15.	Issuing Date	25/04/2025
16.	Revision Date	

17. Course Coordinator:

Name: Prof. Dr. Fathi Shaqour Contact hours: -

Office number: Geology 202 Phone number: ext: 22275

Email: f.shaqour@ju.edu.jo

18. Other Instructors: NA

Name:
Office number:
Phone number:
Email:
Contact hours:
Name:
Office number:
Phone number:
Email:
Contact hours:

19. Course Description:

Geotechnics, Soil and Rock mechanics, boreholes and excavations, sampling, rock and soil lab and in-situ tests, Further site investigation methods: geophysical methods, drilling, sub-surface evaluation. Foundations, settlement, slopes, water pressures, leakages, grouting, water/rock and grout/rock interactions, Geo-hazards, Engineering soil mechanics, Compaction problems, Engineering significance of rock properties, Shear strength of soils and rocks, Dewatering techniques, Case studies on slope stability-Jordan, Soil treatment, and specifications of construction materials.

20. Program Student Outcomes (SO's): (To be used in designing the matrix linking the intended learning outcomes of the course with the intended learning outcomes of the program)

(SO1) Students will be able to design and execute original research, employing advanced methodologies to generate new knowledge in their specialized area of geology

(SO2) Students will display the potential to seriously evaluate complex geological problems, the usage of analytical and problem-fixing capabilities to develop modern answers and interpretations of their studies.

(SO3) Students will benefit knowledge in using cutting-edge gear, techniques, and technology applicable to their geological research, applying these abilities to research and cope with complicated geological phenomena.

(SO4) Students will effectively communicate their studies findings via academic guides, presentations, and conferences, making significant contributions to the scientific network and attractive technical and non-technical audiences.

(SO5) Students will showcase a sturdy dedication to ethical studies practices and apprehend the broader societal and environmental effects of their work, promoting sustainability and integrity within the subject.

(SO6) Students will demonstrate a determination to persistent mastering, actively enticing with rising studies, and professional improvement possibilities to maintain and amplify their know-how throughout their careers.

PILO's	*National Qualifications Framework Descriptors*		
	Competency (C)	Skills (B)	Knowledge (A)
1.	X		X
2.		X	
3.	X		X
4.		X	
5.	X		
6.		X	X

21. Course Intended Learning Outcomes (CLO's): (Upon completion of the course, the student will be able to achieve the following intended learning outcomes)

CLO1 Demonstrate an understanding of the terms, concepts and principles of engineering geology,

CLO2 Demonstrate an understanding of the Earth processes (earthquakes, volcanic activity, erosion and mass wasting) and their influence on the design of civil engineering projects

CLO3 Develop professional skills in engineering geology, such as determining the index engineering properties of soils and rocks, and preparation of engineering geological reports

CLO4 Develop understanding of rock types and engineering classifications of soils and rocks.

CLO5 Be aware of the role of geology in civil engineering design, construction and maintenance, to avoid potential hazards.

CLO6 Apply engineering principles on earth materials

Course CLOs	**The learning levels to be achieved**					
	Remembering	**Understanding**	**Applying**	**Analysing**	**Evaluating**	**Creating**
CLO (1)	✔	✔				
CLO (2)			✔			
CLO (3)	✔			✔		
CLO (4)		✔	✔			
CLO (5)	✔				✔	
CLO (6)	✔	✔		✔		✔

22. The matrix linking the intended learning outcomes of the course with the intended learning outcomes of the program:

Program SO's / Course CLO's	SO (1)	SO (2)	SO (3)	SO (4)	SO (5)	SO (6)	Descriptors**		
							A	B	C
CLO (1)		✔	✔				X		
CLO (2)	✔		✔					X	
CLO (3)	✔		✔				X	X	
CLO (4)		✔	✔					X	
CLO (5)		✔			✔				X
CLO (6)	✔	✔		✔				X	X

23. Topic Outline and Schedule:

Week	Lecture	Topic	CLO/s Linked to the Topic	Learning Types (Face to Face/ Blended/ Fully Online)	Platform Used	Synchronous / Asynchronous Lecturing	Evaluation Methods	Learning Resources
1		General introduction						
2	2	why study the course, General information Concepts of engineering geology Soil and rock types – Eng. Aspects	1	Face to Face			Exams + assignments	Suggested readings + papers
3	2	Advanced and modern techniques for determining the engineering properties of rocks and soils Specialized Eng. properties of igneous rocks	1	Face to Face			Exams + assignments	Suggested readings + papers

		Specialized Eng. properties of sed. and metamorphic rocks						
4	2	Advanced and modern techniques for determining the engineering properties of rocks and soils Specialized Eng. properties of igneous rocks Specialized Eng. properties of sed. and metamorphic rocks	2	Face to Face			Exams + assignments	Suggested readings + papers
5	2	Gradation analysis of soils and interpretation of soil grading curves	3	Face to Face			Exams + assignments	Suggested readings + papers
6	2	Soil phase diagram and Eng. Properties	3	Face to Face			Exams + assignments	Suggested readings + papers
7	2	Exercises and problem solving on soil phase diagram	3	Face to Face			Exams + assignments	Suggested readings + papers
8	2	Atterberg limits: Liquid limit, Plastic and Shrinkage limits Soil compaction: Standard and modified compaction tests.		Face to Face			Exams + assignments	Suggested readings + papers
9	2	Field control tests: inverted cone density test, compaction ratio. **Midterm Exam** **(1 hours)**	4	Face to Face				
10	2	Shear Strength of soils: Unconfined compressive strength (UCS), Direct shear test.	4	Face to Face			Exams + assignments	Suggested readings + papers
11	2	Soil Classification: Unified System	5	Face to Face			Exams + assignments	Suggested readings + papers
12	2	Rock Mechanics: Engineering properties of rocks, work examples	5	Face to Face			Exams + assignments	Suggested readings + papers

13	2	Construction uses of rocks and soils: Aggregates,	6	Face to Face			Exams + assignments	Suggested readings + papers
14	2	Slope stability; types, causes and instability problems, Land subsidence and subsurface openings	5					
15	2	Drilling techniques; types of drilling: undisturbed - disturbed sampling, laboratory testing and interpretation, field testing; SPT, CPT, DCPT, and interpretation	2					
16	2	Test data interpretations, Work examples, Case studies, Eng. Geologic maps, Work examples, Eng. Geologic data interpretation and analyses	3					
		Presentations **Final EXAM**		Face to Face			Exams + assignments	Suggested readings + papers

24. Evaluation Methods:

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

Evaluation Activity	Mark	Topic(s)	CLO/s Linked to the Evaluation activity	Period (Week)	Platform
Midterm Exam	30	TBD	1,2,3	End of eighth week	
Assignments/quizes	10	TBD	1,2,3,4,5,6	Weekly	
Project and presentations	20	TBD	1,2,3,4,5,6	Term-long project due at the end of the semester	
Final Exam	40	TBD	3,4,5,6	End of semester	

25. Course Requirements:

students should have a computer, internet connection, account on a specific software/platform…(elearning)

26. Course Policies:

A- Attendance policies: following the school regulations.

B- Absences from exams and submitting assignments on time: following the school regulations.

C- Health and safety procedures: following the school regulations.

D- Honesty policy regarding cheating, plagiarism, misbehavior: following the school regulations.

E- Grading policy: following the school regulations.

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

27. References:

A- Required book(s), assigned reading and audio-visuals:

- Practical Engineering Geology by Steve Hencher, 2024, handouts, case studies.
- Recommended books, materials, and media: U-tube on experiments, and case studies

28. Additional information:

See list of suggested readings in the course outline

	Signature:	Date:
Name of the Instructor or the Course Coordinator: **Dr. Fathi Shaqour**	……...……	**25/04/2025**……
Name of the Head of Quality Assurance Committee/ Department	Signature:	Date:
	……...……	……..……
Name of the Head of Department **Dr Bety Saqarat**	Signature: ……...……	Date: ……..……
Name of the Head of Quality Assurance Committee/ School of Science	Signature:	Date:
Prof. Emad A. Abuosba	……...……	……..……
Name of the Dean or the Director **Prof. Mahmoud I. Jaghoub**	Signature: ……...……	Date: ……..……