Course Specification
(Bachelor)

Course Title:	**Geological Principles**
Course Code:	**COE2301**
Program:	**Bachelor of Construction Engineering**
Department:	**Civil and Environmental Engineering Department**
College:	**College of Engineering and Computing in Al-Qunfudhah**
Institution:	**UMM Al-Qura University**
Version:	**4**
Last Revision Date:	March 2025

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A. General information about the course:

1. Course Identification

1. Credit hours: (.....2...)					
2. Course type					
A.	☐University	☒ College	☐Department	☐Track	Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: (...3/2.....)					
4. Course General Description:					
Earth surface features and internal structure, effect of natural agencies, types of weathering, mountains and mountains building, physical properties and occurrence of crystals and minerals, formation and classification of rocks, physical properties for constructional purposes of granite and other marble types, volcanoes, overlaps, folds types, ground water, earthquakes and landslides, application to Saudi Arabia. Geological investigation, geology of dams and reservoirs, rock types. Contemporary applications.					
5. Pre-requirements for this course (if any)**:**					
Passed first year					
6. Co-requisites for this course (if any)**:**					
7. Course Main Objective(s):					
By the completion of the course, the student should be able to: **- explain geology and earth surface features.** **- describe crystals and minerals physical properties and formation.** **-discuss rocks formation and their classification, geology of dams and reservoirs, rock mechanics and tunneling.** **- evaluate physical properties for constructional purposes of Granite and other Marble types.** **-recognize structural features of earth crust and engineering considerations.**					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	30	100%
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	30
2.	**Laboratory/Studio**	
3.	**Field**	
4.	**Tutorial**	
5.	**Others (specify)**	
Total		30

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	explain geology and earth surface features	**K1**	Interactive learning Self-directed learning	Assignments , Quiz, Midterm and Final exam
1.2	describe crystals and minerals physical properties and formation	**K1**	Interactive learning Self-directed learning	Assignments , Quiz, Midterm and Final exam
1.3	recognize structural features of earth crust and engineering	**K2**	Interactive learning Self-directed	Assignments , Quiz, Midterm and

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
			learning	Final exam
2.0	**Skills**			
2.1	Analyze geological formations and classify different rock types based on their properties.	**S1**	Interactive learning Self-directed learning	Assignments , Quiz, Midterm and Final exam
2.2	Differentiate between various geological processes related to dam construction, reservoirs, rock mechanics, and tunneling.	**S1**	Interactive learning Self-directed learning	Assignments , Quiz, Midterm and Final exam
2.3	Assess the physical properties of granite and other marble types for construction purposes.	**S2**	Interactive learning Self-directed learning	Assignments , Quiz, Midterm and Final exam
2.4	Interpret geological maps to evaluate subsurface conditions and engineering implications.	**S2**	Interactive learning Self-directed learning	Midterm and Final Assignments , Quiz, Midterm and Final exam
2.5	Apply geological principles to solve engineering problems related to ground stability, earthquakes, and landslides.	**S2**	Interactive learning Self-directed learning	Assignments , Quiz, Midterm and Final exam

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
3.0	**Values, autonomy, and responsibility**			
3.1				
3.2				
…				

C. Course Content

No	List of Topics	Contact Hours
1.	General Geology: Branches and scope of geology, Earth.	**2**
2.	Mineralogy and Petrology.	**2**
3.	Structural geology: Strike and dip, out crops, volcanoes, overlaps, inliers and outliers, types classification of folds, faults, joints, unconformities.	**4**
4.	Engineering Geology: Ground water, zones of ground	**2**
5.	Properties of rocks, occurrence of ground water.	**4**
6.	Mid Term Exam..	**2**
7.	Geological investigation: Interpretation of geological maps.	**4**
8.	Geology of dams and reservoirs	**4**
9.	Rock mechanics.	**4**
10.	Earthquakes and landslides: Classification causes and effects of earthquakes and landslides, seismic curve. Application to Saudi Arabia	**2**
Total		**30**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Assignments	Each week	15%
2.	Quiz	3,9,12	15%
3.	Mid term exam.	7	30%
4.	Final exam.	16 or 17	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Terry R. West, Abdul Shakoor, "Geology Applied to Engineering". Waveland Press, Inc.; 2nd edition March 2018. ISBN-13: 978-1478635000
Supportive References	Christopher C Mathewson, "Engineering Geology", Merrill 1981. ISBN 13: 9780675080323
Electronic Materials	Electronic materials of the required textbook and its PowerPoints slides
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lecture rooms with a capacity of at least 20 students and fitted with multimedia projector and a computer.
Technology equipment (projector, smart board, software)	Data show, Smart Board
Other equipment (depending on the nature of the specialty)	

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students Faculty members who teach this course	Students' questioners running at the semester end. Analysis of students` Marks Regular feedback of the students about the course and the teaching methods
Effectiveness of Students assessment	Examination Committee	Direct: Peer review of examination papers and review or double check a minimum of three or 10% of answer papers.
Quality of learning resources	Faculty	Direct: Course Report
The extent to which CLOs have been achieved	Faculty	Direct and Indirect: Course report
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Civil and Environmental Engineering Department Council in Al-Qunfudah
REFERENCE NO.	The fifteenth session of the academic year 1446
DATE	01/05/2025