

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	General Geology		Module Delivery	
Module Type	Core		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	PENG116			
ECTS Credits	8			
SWL (hr/sem)	200			
Module Level	1	Semester of Delivery		First
Administering Department	PENG	College	ENG	
Module Leader	Dr. Mortada Daghim Abdullah		e-mail	murtadha.Abdullah@alayenedu.iq
Module Leader's Acad. Title	Professor		Module Leader's Qualification	Ph.D.
Module Tutor			e-mail	
Peer Reviewer Name			e-mail	
Scientific Committee Approval Date			Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	The General Geology module provides students with a fundamental understanding of the Earth's structure, composition, and geological processes. The module covers a wide range of topics, including the Earth's position in space, its shape, and surface relief. Students will learn about the properties and classification of minerals, as well as the formation and characteristics of igneous, sedimentary, and metamorphic rocks. The module also explores the processes of weathering, erosion, transportation, and deposition that shape the Earth's surface. Students will gain knowledge of geological time and the formation of geological features such as mountains, valleys, and geological hazards.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of the module, students will be able to: 1. Understand the Earth's position in space and its relationship to the solar system. 2. Describe the shape and surface relief of the Earth, including the major landforms and features. 3. Identify and classify minerals based on their properties and characteristics. 4. Explain the processes of rock formation, including the origin and classification of igneous, sedimentary, and metamorphic rocks. 5. Understand the concepts of weathering and soil formation, and their significance in geological processes. 6. Describe the processes of erosion, transportation, and deposition, and their role in shaping the Earth's surface. 7. Interpret geological maps, cross-sections, and stratigraphic columns to analyze the geological history of an area. 8. Explain the concept of geological time and the principles of relative and absolute dating.
Indicative Contents المحتويات الإرشادية	Earth in Space and Shape (15 hours) Introduction to the solar system and Earth's position in it Celestial bodies and their characteristics Earth's rotation, revolution, and seasons Measurement and shape of the Earth Major landforms: mountains, plateaus, plains, and valleys Earth's internal structure and its impact on surface features Minerals and Rocks (30 hours) Introduction to matter and atomic structure Chemical bonding and crystal structures Properties and identification of minerals Mineral classification and occurrence in different geological environments Formation of igneous rocks: magma, crystallization, and textures Sedimentary rock formation: weathering, erosion, deposition, and lithification

	Metamorphic rock formation: types, processes, and factors influencing metamorphism Weathering, Soils, and Sediments (20 hours) Weathering processes: physical and chemical weathering Factors influencing weathering rates Soil formation and soil profiles Sediment transport and deposition Sedimentary structures and their interpretation Earth's Surface Processes (25 hours) Erosion processes: water, wind, ice, and gravity Fluvial processes: river systems, drainage patterns, and erosion features Glacial processes: glacier formation, movement, and landforms Aeolian processes: wind erosion and deposition, dunes Coastal processes: wave action, coastal landforms, erosion, and deposition Geological Time and Dating Methods (15 hours) Principles of relative dating: superposition, original horizontality, and cross-cutting relationships Fossils and their importance in dating and correlating rocks Absolute dating methods: radiometric dating, carbon dating, and other techniques Geological time scale and major divisions of Earth's history Geological Maps and Interpretation (20 hours) Introduction to geological maps and their symbols Reading and interpreting geological maps and cross-sections Stratigraphic columns and their use in reconstructing geological history Geological structures: folds, faults, and unconformities Introduction to geophysical methods in geological mapping Earthquakes and Volcanoes (25 hours) Plate tectonics and the theory of continental drift Earthquakes: causes, seismic waves, measurement, and effects Volcanic processes: types of volcanoes, volcanic eruptions, and volcanic landforms Volcanic hazards and their mitigation Geological Hazards and Environmental Geology (20 hours) Landslides, avalanches, and subsidence: causes, types, and prevention Coastal hazards: erosion, coastal flooding, and sea-level rise Geological hazards and their impact on human activities Environmental geology: geologic resources, land use planning, and sustainability Geology and Human Civilization (15 hours) Geology in natural resource exploration and extraction Geological factors in engineering projects: dams, tunnels, and foundations
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	Geological considerations in urban planning and development Geology and climate change: past climate records and future predictions Field Excursions and Practical Sessions (20 hours) Field trips to geological sites for observation and interpretation Practical sessions on mineral and rock identification Laboratory exercises on sediment analysis and geological mapping Case Studies and Applications
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Lectures: Traditional lectures can be used to deliver foundational knowledge and concepts related to each topic. This provides students with a comprehensive understanding of the subject matter. Visual Aids: Utilize visual aids such as PowerPoint presentations, diagrams, maps, and videos to enhance understanding and engage students visually. Interactive Discussions: Encourage active participation through interactive discussions and Q&A sessions. This promotes critical thinking and allows students to clarify their doubts and deepen their understanding. Laboratory and Fieldwork: Organize laboratory sessions and field trips to give students hands-on experience in mineral and rock identification, sediment analysis, and geological mapping. This provides practical exposure to geological techniques and promotes field observation skills. Group Activities: Assign group projects or activities that require students to work together to solve geological problems. This promotes teamwork, collaboration, and the sharing of ideas and perspectives. Guest Speakers: Invite guest speakers from the industry or research community to share their experiences and expertise. This provides students with insights into real-world applications of geology and exposes them to diverse perspectives. Formative Assessments: Conduct regular formative assessments, such as quizzes, short assignments, or class discussions, to evaluate students' understanding and identify areas that need further clarification. Field Excursions: Plan field excursions to geological sites of interest to provide students with firsthand exposure to geological features and processes. This helps bridge the gap between theory and practice.
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	Independent Research Projects: Assign independent research projects that require students to investigate specific geological topics in-depth. This encourages independent thinking, research skills, and a deeper understanding of selected areas. Technology Integration: Utilize technology tools and software for data analysis, geological modeling, and virtual simulations. This allows students to explore complex geological phenomena and develop practical skills. Online Resources and Discussion Forums: Use online platforms and resources to supplement learning materials, provide additional readings, and facilitate discussions and collaboration among students.
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Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	109	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعياً	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	91	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعياً	6
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	175		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المناهج الاسبوعي النظري

	Material Covered
Week 1	• Introduction to Geology and Earth Sciences • Earth in Space and Shape
Week 2	• Minerals and Rocks: Properties and Classification • Igneous Rocks: Formation and Types
Week 3	• Sedimentary Rocks: Formation and Classification • Metamorphic Rocks: Processes and Types
Week 4	• Weathering and Soils • Sediments and Sedimentary Structures
Week 5	• Earth's Surface Processes: Erosion, Transportation, and Deposition • Fluvial Processes and Landform
Week 6	• Glacial Processes and Landforms • Aeolian Processes and Landforms
Week 7	• Coastal Processes and Landforms • Geological Time and Dating Methods
Week 8	• Geological Maps and Interpretation • Structural Geology: Folds, Faults, and Unconformities
Week 9	• Earthquakes: Causes and Effects • Volcanoes: Types and Eruptions
Week 10	• Geological Hazards: Landslides and Subsidence • Geological Hazards: Coastal Hazards and Climate Change
Week 11	• Geology and Natural Resources • Geology and Engineering Projects
Week 12	• Field Excursion: Geological Site Visit and Observation • Case Studies and Applications in Geology
Week 13	• Environmental Geology: Land Use Planning and Sustainability • Geology and Human Civilization
Week 14	• Review of Key Concepts and Topics (Tutorial) • Practice Problem-Solving Exercises (Tutorial)
Week 15	• Final Assessment, including Problem-Solving Questions and Application-Based Scenarios
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المناهج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Laboratory Safety and Procedures
Week 2	Mineral Identification: Physical and Optical Properties
Week 3	Rock Identification: Igneous Rocks

Week 4	Thin Section Analysis: Petrographic Microscopy
Week 5	Rock Identification: Sedimentary Rocks
Week 6	Sediment Analysis: Grain Size Distribution and Sedimentary Structures
Week 7	Rock Identification: Metamorphic Rocks Hand Specimen and Thin Section Analysis

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts		No
Recommended Texts		No
Websites		

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جداً	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.