



مركز الاعتماد
و ضمان الجودة
ACCREDITATION & QUALITY ASSURANCE CENTER



The University of Jordan

Accreditation & Quality Assurance Center

Course Syllabus

Course Name:

Earth Resources and the Environment

موارد الارض و البيئة

1	Course title	Earth Resources and the Environment موارد الارض و البيئة	
2	Course number	0305381	
3	Credit hours (theory, practical)	3 hours (3,0)	
	Contact hours (theory, practical)	3 hours (3,0)	
4	Prerequisites/corequisites	0305231	
5	Program title	Applied and Environmental Geology	
6	Program code		
7	Awarding institution	الجامعة الاردنية The University of Jordan	
8	Faculty	Science	
9	Department	Geology	
10	Level of course	Third – fourth year	
11	Year of study and semester (s)	2017/2018 first, second	
12	Final Qualification	BSc.	
13	Other department (s) involved in teaching the course	None	
14	Language of Instruction	English	
15	Date of production/revision	2017/2018	

16. Course Coordinator: Dr. Khitam Ahmad Alzughoul

Office numbers, office hours, phone numbers, and email addresses should be listed.

Office No.: G207

Office Hours: S, M, T, Th (11:00-12:00)

Phone No. : 22260

e- mail: k.alzghoul@ju.edu.jo

17. Other instructors:

Office numbers, office hours, phone numbers, and email addresses should be listed.

18. Course Description:

As stated in the approved study plan.

This course is an introductory presentation of physical and chemical characteristics of resources of the earth. Emphasis will be placed on the descriptive geology and origin of economic mineral concentrations: Minerals; the foundations of society. Energy from fossil fuels; energy for the future: nuclear energy; abundant metals; fertilizer and chemical minerals; water resources; soil resources: formation, types, distribution and uses; future resources; environmental impact assessment of resources exploitation and use; assessment of the environmental dangers of large projects.

1. 19. Course aims and outcomes:

A- Aims:

1. To acknowledge the basic geologic processes and concepts using the framework of Earth resources. And the geologic processes that are responsible for the formation and distribution of resources
2. To realize that everything we use comes from somewhere on Earth and when we are done with it, it ends up somewhere.
3. To Think about what resources we use daily, both intentionally and unintentionally, where those resources come from, and environmental consequences of exploitation, manufacturing, and use.
4. contribute to solving challenging problems related to earth resources and energy sectors together with graduates of other disciplines.
5. To consider the science behind politically-charged environmental issues so that informed, and intelligent decisions can be made.
6. To consider the reasons for and remedies to environmental problems, and to contribute to Environmental Impact Assessment of Natural Resources –Oriented Projects
7. To Show how every-day-decisions made by individuals like you and me affect the land we live on, the water we drink, and air the breath.
8. Contribute scientifically and ethically to the development of the society.

B- Intended Learning Outcomes (ILOs): Upon successful completion of this course students will be able to ...

1. To learn the basic geologic processes and concepts using the framework of Earth resources.
2. To realize that geologic processes are responsible for the formation and distribution of resources and they have impacts on the shape our present day economy, policy, and lifestyles.
3. Understand the geologic processes responsible for the formation and distribution of natural resources and how they shape our present day economy, policy, and lifestyles.
4. Acquire an understanding of scientific foundations of different types of Natural resources Be able to Categorize them based on their chemical characteristics, occurrences and/ or source or genesis.
5. Demonstrate knowledge of various exploration methods (geological, geochemical and geophysical) to conduct a prospecting survey for specific natural resources.
6. Develop good inter-personal and communication skills through writing and contributing to critical discussion in groups.

20. Topic Outline and Schedule:

References	Assessment	Outcomes	Instructor	Week	Content
Introduction Ch. 1	- Assignment -Quiz -First Exam	1	Dr. Khitam Alzughoul	1	1. Introduction, - Definitions: resources, mineral deposits, Ore, Economic Geology - Minerals: The foundations of society.
Ch 1, 2 Class notes Ch 20	- Assignment -Quiz - First Exam	1 ,2	Dr. Khitam Alzughoul	2	2. Principles , Grade, mineral deposits Classification, mining terminology <ul style="list-style-type: none">• Earth resources through history - Introduction to Non Metallic Resources: Building materials and other industrial minerals Fertilizer, chemical, construction & industrial resources
Ch 4 Class notes	- Assignment 3 -Quiz - First Exam	1, 2,3	Dr. Khitam Alzughoul	3-4	3. Sources 4. What necessary to form Ore deposits <ul style="list-style-type: none">• Ore forming fluids; sources,• means of transport, p. 62• means of precipitations
Class notes	- Assignment 4 -Quiz - First Exam	1,2,3,4,5	Dr. Khitam Alzughoul	4-5	5- Exploration, Analytical methods Mineral Explorations: geology, geochemical, geophysical, Drilling
Ch 2 Ch 5, Class Notes	- Assignment 5 Quiz hand samples, Groups -Second Exam	1, 2, 3, 4, 6	Dr. Khitam Alzughoul	5 -6	6. Mode of Occurrence, morphology of the principal types of Ore Deposits Textures, Paragenetic Sequence, Zoning, Wall rock alterations
Ch 3 Class notes	- Assignment 6 -Quiz - second Exam	1, 2, 3, 4, 5,6	Dr. Khitam Alzughoul	7	7. Geochemical Alterations -
Class notes	- Assignment -Quiz	2, 3, 4, 5,6	Dr. Khitam Alzughoul	8	8. Evaluation, Extraction and Mining methods

	- Second Exam				- Environmental consequences
Bjørlykke Knut, Ch 1, Class notes	- Assignment -Quiz - Second Exam	1,2, 3, 4, 5, 6	Dr. Alzughoul	9-10	9- Energy Resources <ul style="list-style-type: none"> • Energy from fossil fuels, Geology: Coal, Oil, Tar Sands • Energy for the future- Renewable & Nuclear Power • Oil Shale in Jordan
Ch. 10 Class Notes Ch. 7 Class Notes		1- 6	Dr. Alzughoul	10-12	10. Magmatic Ore deposits <ul style="list-style-type: none"> • Orthomagmatic deposits Cr, PGEs, Iron (Bushveld) • Diamond Deposits
Ch. 14 Ch. 15, 19 Class notes	Quiz Hand samples	1- 5	Dr. Alzughoul	12-13	11. Introduction to porphyry Ore deposits: Cu Supergene Cu Enrichment
Ch 17 Ch 18		1-5	Dr. Alzughoul	13-14	12. Uranium Ore deposits 13. Sedimentary Ore deposits
	-Seminars -Project Discussion & Presentations	1-6	Dr. Khitam Alzughoul	14- end	14- Projects & Presentations
			Dr. Alzughoul	TBD	15- final examination

21. Teaching Methods and Assignments:

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

1. Power point presentations; Presentations of pictures, images, Cartoons and videos
2. Show and tell of samples representing different types of Natural Resources from different locations among the world
3. Class Discussion, group discussions
4. Website visit Watching videos related to topic
5. Field trips
6. Seminars, Term Projects, Team work assignments

22. Evaluation Methods and Course Requirements:

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

1. delivering Assignments
2. Quizzes
3. Reports
4. Exams
5. Seminars
6. solving problems through discussion

23. Course Policies:

A- Attendance policies: Daily checking

All students are expected to attend all classes and should arrive on time. **Attendance** is essential to learning, be there. Students should maintain discipline and respect one another in both words and action. They are expected to come prepared and participate actively in class discussion. **Be on time.** Active participation is essential to learning.

According to University regulations, the maximum absence allowed is 15% of classes. Makeup exams be given for accepted excuses.

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

-Following the University rules in this regards: if the student provide a legitimate excuse, then another compensation exam will be given.

A quiz will be given during most lectures (unless an exam is scheduled). Each quiz will be 2-4 questions and based on the previous week's lecture. Quizzes cannot be made up. The lowest quiz grade will be dropped.

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due past, without notice and justification, the submission is not accepted.

C- Health and safety procedures:

Following The University regulations

D- Honesty policy regarding cheating, plagiarism, misbehavior:

* If the cheating have been proven or if student cause any disturbance during the exam; then the legislations and violation approved by the University of Jordan will be followed.

(If cheating is proven, then student/s, will be showed up upon investigation committee and university's regulation rules. In this regards will be followed.)

إذا ثبت غش الطالب في الامتحان او ساهم في تعكير النظام الصفّي فيتم تطبيق العقوبات المعمول بها في كلية العلوم و الجامعة *
الاردنية و حسب الأصول

E- Grading policy:

* First exam 20%, Second Exam 30%, Assignments + midterm project (10%) and Final Exam (40%)
 ___ Grades will be calculated based on points accumulated during the semester (50% for the first & second exams and activities). At the end of the semester there will be a comprehensive final exam. This exam will constitute 40% of your final semester grade.
 Attendance, Quizzes, Participations & Assignments 10%

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

* The Library, Computer Center, and Hard rocks and Minerals Labs.

24. Required equipment:

1. The Library
2. Computer and Data Show
3. Internet and electronic services
4. Transmitted Polarizing Microscope (regular and Reflected), Specified samples (metallic and non metallic), Lenses, magnets, scales, Maps, Movies of mining and exploration methods and Environmental Impacts.

25. References:

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

- Evans, A.: 2010: Ore Geology and Industrial Minerals ; An Introduction; Blackwell Science, USA
- Bjørlykke Knut, 2015; Petroleum Geoscience From Sedimentary Environments to Rock Physics; Second Edition, Springer Heidelberg New York Dordrecht London, 666p.
- Craig, J. R., Vanghan, D., and Skinner, B., 2010: Resources of the Earth, 4th Ed. Prentice Hall, USA.

B- Recommended books, materials, and media:

Guilbert, J.M., and Park, C.F., Jr., 2008, The Geology of Ore Deposits, Freeman, USA

Misra, K, 2001, Understanding Mineral Deposits, Wiley New York

Kesler, S.E., 1994, Mineral Resources, economics and the environment (Kesler 1994)

Economic Geology and Mineral industry Journals

Economic Geology, Mineralium Deposita, Ore Geology Reviews

Journal of Geochemical Exploration

Industrial Minerals , AAPG Bulletin (Explorer)

26. Additional information:-

Name of Course Coordinator: Dr. Khitam Ahmad Alzughoul---Signature: ----- Date: -----

Head of curriculum committee/Department: ----- Signature: -----

Head of Department: -- Dr. Ghaleb Jarrar - Signature: -----

Head of curriculum committee/Faculty: ----- Signature: -----

Dean: ----- -Signature: -----

Copy to:

Head of Department
Assistant Dean for Quality Assurance
Course File