

**Natural Resources in Israel
(ANAR 113)**

**“A Land Whose Stones Are Iron” (Deuteronomy 8:9): Past, Present and Future Perspectives on Natural Resources in Israel
(undergraduate)**

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Office hours: Tu, 5-7pm (office: SSB292 [OR IMMEDIATELY AFTER CLASS])

Class meetings: TuTh, 3:30P-4:50P

Room: TM102 1

Course Description:

The course provides a basic overview of Israel's natural resources, including water, stone, metal, minerals, oil and gas. Case studies on ancient exploitation of these resources will be presented (e.g., “King Solomon's Mines”, water management in Biblical Israel, and more), followed by a discussion on the current role of these resources in the economy of modern Israel. Emphasis will be given to resources that are at the core of current political and regional tension, such as the water of the Jordan River and the newly discovered gas fields in the Mediterranean.

Course objectives:

At the end of this course, you will be able to:

- Understand basic terms and concepts in geology and Earth Sciences
- Describe the geography of the Middle East and the natural resources available in this region (with a focus on the Land of Israel)
- Present case studies of conflicts over natural resources from the archaeology and history of Israel, and compare them to other cases world-wide
- Understand the role of natural resources in the economy of Israel and neighboring countries (past and present)
- Analyze current political conflicts in light of tension over access to natural resources

Course Units

Unit 1: Syllabus, Get Acquainted and Introduction

Unit 2: Geographic and Geological Settings

Unit 3: Minerals, Rocks and Soils

Unit 4: Metals

Unit 5: Oil, Gas and Water

Unit 6: Looking into the future (Israel & the Middle East)

Work

All work for this class should be typed, double-spaced, and use black 12-point font. Follow the Chicago Manual of Style. Consult the instructor if you have questions. All work should be submitted online using TritonEd, either as a direct entry or as a Microsoft Word file.

Late Policy and Word Limits

The word limit, as specified for each work in the syllabus, is a necessary requirement that aims to train you to express complex thoughts in a concise form. A work that exceeds the word limit will be returned for shortening before grading. Late work will be accepted, but dropped 1 point for each day it is late. If you have extenuating circumstances or need special accommodations, please contact me before the due date and I will be happy to accommodate you.

Disability

If you are a student with a documented disability who requires accommodations, or if you think you may have a disability and want to inquire about accommodations, please contact UCSD's Office for Students with Disabilities <https://students.ucsd.edu/well-being/disability-services/index.html>.

Ethics Policy

Please read the Code of Academic Conduct at <http://sja.ucdavis.edu/files/cac.pdf>. Unless specifically authorized by the instructor in writing, misconduct includes, but is not limited to, cheating on exams or other coursework, plagiarism, unauthorized collaboration, misuse of an instructor's course materials or the materials of others, lying or fraud, giving false excuses to obtain exceptions, forging signatures or submitting documents containing false information, submitting the same work in two or more different classes without the permission of the instructors, and other activities specified in the Code of Academic Conduct. Students who violate the University Code of Academic Conduct are subject to disciplinary sanctions that include censure, probation, suspension, deferred separation, or dismissal from the University of California.

Required Readings

Weekly readings are listed within the syllabus. All articles are available online through Google Scholar. Textbook for class: *Understanding Earth, 6th edition [or higher]* (Frank Press and Raymond Siever, updated by John Grotzinger and Tom Jordan, Freeman publishing house).

The textbook for the class is available on TritonEd as an e-book; please follow instructions:

Your course materials are provided by the UC San Diego Bookstore through TritonEd and are free for the first two weeks of classes. After two weeks, your student account will be charged a special reduced price if you decide to opt-in. If you opt-in and change your mind you must complete the opt-out by 10/13/18 and you will be responsible for sourcing the materials elsewhere. If you opt-in after 10/13/18 you will not have the option to opt-out.

Click [here](#) to view how to access your course materials or opt-in and out.

For any questions about billing please contact textbooks@ucsd.edu.

For any questions about using your eBook please reference [RedShelf Solve](#).

If you have any trouble accessing your eBook please feel free to reach out to help@redshelf.com.

Assignments

Class participation

Each session involves in-class activities, and your attendance indicates your readiness to participate in these activities. Activities in class often serve as the basis for your individual homework assignments and

thus require your attentive and active involvement. Unless you leave in the midst of a lesson, or express an unwillingness to participate, you will earn 0.5 point for each session you attend. Participation expectations are explained in the weekly in-class activities section within the syllabus.

In-class and home assignments

Your final grade is based primarily on these assignments, which include three quizzes and other short tasks. There is no mid-term paper or exam, but constant work throughout the quarter according to the study unit.

Task	Due	Maximum points
Attendance	-	10
Active participation	-	4
Introduction – definitions	10.2.2018	6
Introduction – news items	10.2.2018	10
Fault	10.4.2018	5
Geographic regions	10.8.2018	20
Quiz on reading material	10.11.2018	10
Quiz on reading material	10.18.2018	10
Archaeological artifact	10.23.2018	5
Quiz on reading material	10.25.2018	10
Presentations of rock types	10.25.2018	15
“Processual Archaeology”	10.30.2018	5
Determinism	11.1.2018	10
Bible reference	11.6.2018	5
Cu, Fe	11.8.2018	6
chaîne opératoire	11.8.2018	2
Camels	11.13.2018	5
Quiz on reading material	11.13.2018	10
Mining song	11.15.2018	2
Quest for Solomon’s Mines	11.15.2018	15
Water problem	11.27.2018	5
Water problem #2 (global)	11.29.2018	10
Environmental impact	12.4.2018	5
Longue durée	12.6.2018	5
Extra credit (short essay)	12.13.2018	10

Total points = 190

Note: Your grade will be calculated by dividing the total number of your earned points by 190, as illustrated in the table below.

Points	Grade (points divided by 190)	Grade
186-190	98-100%	A+
179-185	94-97%	A
171-178	90-93%	A-
167-170	88-89%	B+
160-166	84-87%	B
152-159	80-83%	B-
133-151	70-79%	C
124-132	65-69%	D
0-123	0-64%	F

Note also that curving is optional.

Unit 1: Syllabus, Get Acquainted, and Introduction

Goals for this unit - by the end of this unit students should be able to:

- Recognize the names of classmates and of instructor
- Know where to find and how to use course syllabus
- Understand the assignments, course requirements, and grading policy
- Formulate individual expectations about the course
- Understand how the individual expectations are related to the course goals
- Feel comfortable to ask questions and take active part in discussions

9.27.2018

Read for class

- Syllabus

In-class activity:

- Introductions: (names, background)
- Israel Quiz (general knowledge – not part of the course's grade)

Home assignment

- Define: (1) "Middle East"; (2) "Near East" (200 words each; include source) [6 points]
- Find online a news item from the Middle East related to natural resources in the region and prepare a 2-3minutes presentation of the topic (oral, no visuals except a general map that will be displayed in class) [10 points]

10.2.2018

Read for class

- Syllabus

In-class activity:

- Oral presentations (2-3 minutes) of selected news items
- Discussion on course goals in class

Home assignment

- Watch this short YouTube clip: <https://www.youtube.com/watch?v=ZxPTLmg0ZCw>; submit a map view of the fault with arrows indicating directions of the movement [5 points]

Unit 2: Geographic and Geological Settings

Goals for this unit - by the end of this units students should be able to:

- Identify geographic units within Israel and neighboring regions and understand their distinct physical and biological characteristics
- Use basic terms in geology and Earth Sciences in discussions on natural resources

- Differentiate between Israel’s natural resources based on potential contribution to the state’s economy, and based on their role in regional conflict

10.4.2018

Read for class

- *Understanding Earth: Chapter 2 (first half ~p.42 in 7th edition)*
[recommended optional reading: Chapter 1]

In-class activity:

- *Divide into groups and prepare presentations on the various geographic regions of Israel (Negev; Aravah; Judean Hills; Samaria; Jordan Valley; Galilee; Coastal Plain; Shephela; Sharon; [possibly other region]). Focus on: geography, topography, geology, climate, and potential natural resources (as far as you can get information from the web)*

Home assignment:

- Finish presentations

10.9.2018

Read for class

- *Understanding Earth: Chapter 2 (second half)*

In-class activity:

- *Presentations of geographic regions in teams [20 points]*

Rubric

Criteria – how to do the assignment right	Points possible	Points
geographic regions – class presentations		
Covering all topics (geography, topography, geology, climate, and potential natural resources)	5	
Clarity of oral presentation	4	
Visuals	3	
Content – accuracy	4	
Content – covering the important features	3	
Structure and timeframe	2	

Home assignment:

- Prepare for quiz on reading

10.11.2018

Read for class

- *Understanding Earth: Chapter 2*

In-class activity:

- Quiz on reading material – multiple choice [10 points / Clickers]

Home assignment:

- Find a small piece of rock and write a short description of it; bring it to class (of 10.16.2018)

10.16.2018

Read for class

- *Understanding Earth: Chapter 3 (first half [up to 'What are Rocks?', page 74 in the 7th edition])*

In-class activity:

- *The rocks of San Diego: discussion in class based on the samples the students brought*

Home assignment:

- Prepare for quiz on reading (Chapter 3)

10.18.2018

Read for class

- *Understanding Earth: Chapter 3 (second half)
[recommended optional reading: Chapters 4+5]*

In-class activity:

- Quiz on reading material – multiple choice [10 points / Clickers]
- Open discussion: how the physical environment impact history?

Home assignment:

- As a background to the next units – which include case studies from the history and archaeology of the Land of Israel – go to the Israel Museum archaeology section here - <https://www.imj.org.il/en/wings/archaeology/archaeology-land-israel> and choose an archaeological item to present shortly in class: focus on what is it, where it was found, and most importantly **from which period it is and how this period is characterized.**

Unit 3: Minerals, Rocks and Soils

Goals for this unit - by the end of this units students should be able to:

- *Differentiate between processual (/deterministic) and post-processual approaches to the interpretation of human-nature interactions (in past and present)*
- *Recognize the important minerals, rocks and soils of the Land of Israel and provide examples on how they shaped the history of the region*

10.23.2018

Read for class

- <https://www.imj.org.il/en/wings/archaeology/archaeology-land-israel>

In-class activity:

- Present your chosen archaeological artifact and its historical period (5 minutes) [5 points]
- Rocks of Israel – geological map: the goal of this exercise is to learn how to work with geological maps, and to get to know the available rocks in Israel. Each group choose a color (=rock type) from the map and prepare a presentation, including: rock type, mineralogy, geological period, formation process, spatial distribution, characteristics, uses. Begin in class and continue at home.

Home assignment:

- Finish presentations on rock types
- Prepare for archaeological periods quiz (based on reading material)

10.25.2018

Read for class

- Finish reading <https://www.imj.org.il/en/wings/archaeology/archaeology-land-israel>

In-class activity:

- Quiz on reading material – multiple choice [10 points / iClickers]
- Presentations of rock types (10 minutes) [15 points]

Rubric

Criteria – how to do the assignment right	Points possible	Points
Rock types presentations		
Covering all topics (rock type, mineralogy, geological period, formation process, spatial distribution, characteristics, uses)	7	
Clarity of oral presentation	2	
Visuals	1	
Content – accuracy	3	
Structure and timeframe	2	

Home assignment:

- Define “Processual Archaeology” and “Post-Processual Archaeology” – one paragraph each, include source [5 points]

10.30.2018

Read for class

- Joseph A. Epstein, Utilization of the dead sea minerals (a review), *Hydrometallurgy*, Volume 2, Issue 1, 1976, Pages 1-10

In-class activity:

- Processual vs. Post-Processual interpretation: a case study and discussion

- *Minerals and soils of Israel – open discussion*

Home assignment:

- Find a deterministic explanation to the current “Arab Spring” in the media and summarize it in one paragraph including source [10 points]

11.1.2018

Read for class

- <http://www.gsi.gov.il/eng/?CategoryID=113&ArticleID=160> (important resources in *modern Israel*)

In-class activity:

- *Processual vs. Post-Processual interpretation: a case study and discussion*
- *Minerals and soils of Israel – open discussion*

Home assignment:

- Find in the Old Testament a reference to the land being a source for copper [5 points]

Unit 4: Metals

Goals for this unit - by the end of this unit students should be able to:

- Explain the role of metals in humans societies – from its early days to modern time
- Identify the impact of metals on Israel history and archaeology
- Know how to approach the Old Testament: as a source of historical and geographic information
- Provide examples of metal mining sites in Israel and neighboring countries, and explain their importance to the World Heritage

11.6.2018

Read for class

- Craddock, P.T. 1995. *Early Metal Mining and Production* (Edinburgh): Chapter 1

In-class activity:

- *Associative discussion: what does the title “King Solomon’s Mines” mean to you?*
- *Metals in antiquity; metal resources in the land of Israel*

Home assignment:

- Go to <http://table.minutephysics.com/#state> and watch videos for copper and iron; answer the following questions [2 points each, total = 6]:
 - Is copper a soft or hard metal?
 - What’s the atomic number of iron?
 - What’s rust?

11.8.2018

Read for class

- Ben-Yosef, E. 2010. Technology and Social Process: Oscillations in Iron Age Copper Production and Power in Southern Jordan (Ph.D. dissertation, University of California, San Diego). San Diego. CHAPTER 9.

In-class activity:

- *From ore to metal: complete the chaîne opératoire on board [2 points for correct answer in your turn; based on reading materials]*

Home assignment:

- Prepare for 3rd quiz on the history of copper exploitation in the Land of Israel (based on reading materials)
- Go to: <http://archaeology.tau.ac.il/ben-yosef/CTV/index.html> and find what is the connection between copper exploitation and camel domestication in the Middle East according to recent research – 1 paragraph [5 points]

11.13.2018

Read for class

- Read the conclusions of the UCSD field project in the copper mines of Jordan: go to <https://telaviv.academia.edu/ErezBenYosef> and download there the article titled “Conclusions”

In-class activity:

- *Quiz on reading material – multiple choice [10 points / iClickers]*

Home assignment:

- Go to <https://www.facebook.com/CentralTimnaValleyProjectCtv> and find in the posts a song that connects the modern copper mines of Israel and the ancient/biblical ones. Who is the singer? [2 points]

11.15.2018

Read for class

- Veldhuijzen, H.A. and Rehren, T. 2007. Slags and the city: early iron production at Tell Hammeh, Jordan and Tel Beth-Shemesh, Israel. In: LaNiece, S., Hook, D. and Craddock, P., eds. Metal and Mines: studies in archaeometallurgy. London: 189-201. [google scholar]

In-class activity:

- *Watch the movie PBS Nova Quest for Solomon's Mines HD, and answer the following questions in class*
 - *What did King Solomon build in Jerusalem? [1 point] _____*
 - *What is the meaning of “Khirbat en-Nahas” in Arabic? [1 point] _____*
 - *What does John Grattan study? [1 point] _____*

- Describe the debate about the period of David and Solomon – What lies in its core? What is the relevant archaeological evidence? What is the contribution of the new evidence of Iron Age copper production to the debate? [12 points]

Rubric

Criteria – how to do the assignment right	Points possible	Points
The debate over the historicity of Kings David and Solomon		
Defining the debate	2	
Describing pertinent archaeological evidence (based on the PBS movie)	4	
Discussing the contribution of the new evidence of Iron Age copper production to the debate	4	
Clarity of writing / structure / organization	2	

Unit 5: Water, Oil and Gas

Goals for this unit - by the end of this unit students should be able to:

- Accurately use the terminology related to gas, oil, oil shales and the basic methods of their extraction
- Understand the background for gas- and water-related challenges in the Middle East
- Compare Israel’s “water problem” – and the means to cope with it – to similar situations world-wide
- Place the role of water within the current political conflicts in the Middle East

11.20.2018

Read for class

- Barker, G. 2002. *A tale of two deserts: Contrasting desertification histories on Rome's desert frontiers. World Archaeology 33 (3): 488-507.*

In-class activity:

- Guest lecture on the study of climate change and the desertification of the Middle East

11.27.2018

Read for class

- Ameri, Hussein A. (2002). "Water War in the Middle East: a Looming Threat". *The Geographical Journal*. 168 (4): 313–323
- Cooley, John, K. (1984). "The War over Water". *Foreign Policy*. 54: 3–26

In-class activity:

- In groups – based on the readings and your general knowledge, devise possible solution(s) to the water problem in the Middle East; make a short list that will serve as a basis for discussion in class [5 points; list is evaluated on the accuracy of the context only]

Home assignment:

- Find online other regions in the world with water-related conflicts; describe it in one paragraph (up to 200 words), including source [10 points]

11.29.2018

Read for class

- Shaffer, B. 2011. Israel—New natural gas producer in the Mediterranean. *Energy Policy* 39 (9): 5379-5387

In-class activity:

- *Presentation/discussion of conflicts over water (based on home assignment)*

Home assignment:

- Read: <https://www.jpost.com/Jerusalem-Report/Paradise-lost-500775> and find related items. Prepare an argument for *or* against the green movement agenda, and be ready to present it in class

Unit 6: Looking into the future (Israel & the Middle East)

Goals for this unit - by the end of this unit students should be able to:

- Identify the environmental and economic background of current news items related to the Middle East
- Articulate evidence-based arguments related to possible future solutions to conflicts in the Middle East
- Contextualize current issues in the Middle East within the “longue durée”

12.4.2018

Read for class

- Allan J., and Allan T., 2002 *The Middle East Water Question: Hydropolitics and the Global Economy* (Tauris: London). CHAPTER 8 – the future role of water in the Middle East
- *Understanding Earth*, Chapter 22

In-class activity:

- *Exploitation of natural resources and their environmental impact – in class presentations of arguments related to the new gas fields (based on home assignment) [5 points]*

Home assignment:

- Define: “longue durée” (150 words; including source) [5 points]

12.6.2018

In-class activity:

- *Summary and discussion on class materials and overview: expectations versus actual content*
- *Instructions for the extra credit (short paper)*
 - *Find a natural resource in Israel that we did not discuss in class*
 - *Write a short essay on its past and present exploitation; Up to two pages (1500 words)*
 - *Follow instructions in the rubric below*
 - *Due date: 12.13.2018 [10 points, extra credit]*

Rubric

Criteria – how to do the assignment right	<i>Points possible</i>	<i>Points</i>
<i>Less common natural resources in Israel</i>		
Finding relevant topic and materials	2	
Use of at least two reliable sources	2	
Essay structure: logical presentation of the topic, with introduction, body, and summary	3	
Reference to past as well as present exploitation history	3	