



Introduction to Earth Sciences

Spring 2017

Dr. Yaron Finzi

3 weekly lecture hours, 3 credits

This course will present an introduction to Earth Sciences. The course will emphasize the connections between the various earth systems (Geosphere, Hydrosphere, Atmosphere and Biosphere) and it will introduce the students to the "Natural History of the Arava Valley".

Course Requirements

The course will include two mandatory full-day field trips, worksheets and exercises ("active learning"). The students are expected to complete the required readings and come to class prepared to discuss that week's readings.

In addition to participating in class discussions and field trips, students will have a midterm exam, a group project and a final exam.

The main reading of this course is from the book: Chris King, 2010, The planet we live on - the beginnings of the Earth Sciences. Some more reading is from papers with relation to the Arava Valley.

Grading:

Homework and quizzes	20%
Midterm Exam	15%
Discovery/DST project	10%
Final Exam	40%
Participation	15%

Schedule

1) 14.2.16: Introduction to the course (Yaron)

Assignment: "The planet we live on" pp 1-8, 71-73, Arava geography and geology (Haviv I.). A 5 minute (2Q) quiz at the start of next lesson will test you on the reading!

2) 21.2.16: Rocks & Minerals, the Rock Cycle "Earth Materials and Processes" (Yaron)

Assignments: "The planet we live on" pp 11-36, 45-55. Define rocks and key terms. Watch 'Principles of stratigraphy...' video to learn about unconformities. Expect a 2Q quiz!

3) 28.2.16: Stratigraphy, geomorphology, Google Earth cross-sections (Yaron)

Assignments: read "The planet we live on" pp 37-46, 56-65; prepare Arava elevation profiles (if needed check out 'topographic map.ppt'; submit by 10/3); prepare 2-4 slides on a selected natural wonder (discovery project stage 1, submit by 16/3).

4) 6.3.16: Experiments in Earth Sciences. (Maale Shahroot school- Dr. Hanan Ginat)

Assignments: Watch video on sedimentary rocks. For the Ketura outing prepare an A4-size poster to present the formation environment or the formation process or how to identify one of the following rocks: sandstone, limestone, shale, gypsum, chert/flint.

5) 13.3.16: Mid-term (1 hour quiz) and Ketura outing. (Yaron)

Assignments: Read "The planet we live on" pp 74-88; Draw a geologic cross-section of the Arava based on: Smit et al 2010, Garfunkel and Ben-Avraham 1996, miniposter#5).

6) 20.3.16: Earth structure, internal processes and plate tectonics (Yaron)

Assignment: plate tectonics module: http://www.globalchange.umich.edu/ben/g351/plate_tectonics.swf

Read (in small groups): DST book (one chapter of these: 1, 4, 5, 7, 9). Prepare graphic summary of key points (submit 4-5 ppt slides by 7/4). (Grads will present DST topics on 9/5 or 22/5!)

7) 27.3.16: Regional geology and earthquakes + prep for Shehoret (Y)

Continue work on discovery projects (add geologic interpretation) and research/DST projects. Select 5 volunteers to present on 10/4.

8) 3.4.16: Fieldtrip – Nahal Shehoret (Yaron; ~ 7:00-14:00). (Yaron)

Assignment: Prepare 10-15 minute presentations on discovery/DST OR research projects (grads).

9) 10.4.16: First 5 discovery/DST presentations, Shehoret trip summary + research.

* Submit (by 3/5) DST/discovery project report –3-5 page printed +illustrated including: introduction to the topic/location/phenomenon, geologic interpretation and cross-section, relevant research or scientific significance, bibliography.

10) 1.5.16: Arava landscape evolution (geomorphology) and current research (Dr. Hanan Ginat).

Readings (for fieldtrip): Ginat H., et al, 2009.

11) 9.5.16: Summary of DST/discovery project presentations + preparation for Timna fieldtrip (mapping, terrace evaluation, seismic hazards, overview of Ginat H., et al, 2009). (8:00-10:00).

12) 15.5.16: Fieldtrip to Timna Valley (Yaron, 7:30-13:30).

13) 22.5.16: Research project and DST presentations and course summary (Yaron)

14) 29.5.16: Final Exam