



## Introduction to Earth Sciences

Dr. Yaron Finzi

3 weekly lecture hours, 3 credits. Undergraduate

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	15%
Midterm Exam	15%
Discovery project	15%
Final Exam	40%
Participation	15%

## **Schedule**

### **1) Introduction to the course (Yaron)**

Assignment: "The planet we live on" pp 1-8, 71-73.

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

Assignments: "The planet we live on" pp 11-36. Watch 'Principles of stratigraphy...' video to learn about unconformities.

### **3) Stratigraphy, geomorphology, Google Earth cross-sections (Yaron)**

Assignments: read "The planet we live on" pp 45-55; prepare Arava elevation profiles (if needed check out 'topographic map.ppt'; submit by 20/3); For the Ketura outing, in groups of three, prepare A4-size posters to present the characteristics and how to identify three of the following rocks: sandstone, limestone, shale, gypsum, chert/flint.

### **4) Ketura outing (Yaron)**

Assignments: read "The planet we live on" pp 37-46, 56-65; Watch video on sedimentary rocks. Prepare 2-4 slides on a selected natural wonder (discovery project stage 1, submit slides and short explanatory text by 23/3).

### **5) Review of material (Q&A), Mid-term (1 hour) and discovery project introduction. (Yaron)**

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

### **6) Fieldtrip – Nahal Shehoret. (Yaron)**

Assignment: plate tectonics module: [http://www.globalchange.umich.edu/ben/g351/plate\\_tectonics.swf](http://www.globalchange.umich.edu/ben/g351/plate_tectonics.swf)

Continue work on discovery projects (add geologic interpretation – e.g. geologic history).

### **7) Earth structure, internal processes and plate tectonics (Yaron)**

Assignment: Prepare 10-15 minute presentations on discovery projects (for 15/5).

### **8) Regional geology and intro to earthquakes (Guest lecturer: Dr. Hanan Ginat & Yaron)**

### **9) Earthquake science, seismic risks and social resilience**

### **10) First 5 discovery talks, Paleontology (Dr. Sarit Ashckenazi-Polivoda).**

\* Submit (by 25/5) 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.

**11) Arava fieldtrip and current research** (Yaron, Dr. Sarit A-P/ Dr. Carmit Cohen).

**12) Summary of discovery projects + current research + grad research talks.**

**13) Final Exam**