

Limnology and limnogeology – 2 credits

Course Number: 224.4033

Lecturer: Prof. Nicolas Waldmann

Office Hours: Monday 12:00-14:00, Multipurpose Building – Room 130, tel.
048280736

Course Type: Lecture

Course Level: MSc

Prerequisites: No

Course Description:

This course links lakes, their subsurface, and their environment. It will show how lake sediments record past environmental changes (e.g. climate, human impact, and natural hazards). Emphasis is also given on the modern limnologic processes essential in interpreting the fossil record, with a 2-day field course in the Dead Sea.

Main points covered in the course:

1. Understanding the role of lake sediments as archives of environmental change. Understanding the complexity of a lake system with all its connections to the environment.
2. Understanding the role of lakes as archives and partly amplifiers of natural hazards.
3. Understanding lakes as an evolving element within a larger environmental system.

Topics:

1. Introduction to limnogeology: lakes as small oceans.
2. Abiotic processes in lakes.
3. Particle sedimentation and siliclastic environments in lakes.
4. Biological indicators in paleolimnology.
5. The water column: aquatic physics.
6. Geochemical processes in paleolimnology.
7. Importance of laminations and varves in lake sediments.
8. Hydrologically closed lake systems: their importance in paleoenvironmental reconstructions.
9. Dating techniques in limnogeology.
10. Basin analysis techniques in paleolimnology.
11. Analytical systems in paleolimnological analyses.
12. Lake sediments as proxies for climate change and anthropogenic impact.

Learning Outcomes:

At the end of the course students will be able to:

1. Being able to plan an own limnogeologic campaign, i.e. finding, recovering, analyzing and interpreting the sedimentary archives to solve a particular scientific question.
2. Being able to link subaerial processes with subaquatic processes.

Requirements: Exam, Homework assignments, Reports and Class presentations.
Lectures will be given online (zoom) in case it is required.

Grading: Excursions + 85% of the exercises and quizzes.

Reading List:

1. Paleolimnology: The History and Evolution of Lake Systems (Cohen).
2. Tracking Environmental Change Using Lake Sediments - Vol. 1: Basin Analysis, coring and chronological techniques (Last & Smol).