האוניברסיטה העברית בירושלים
THE HEBREW UNIVERSITY OF JERUSALEM

The Hebrew University of Jerusalem

Syllabus

Introduction to stratigraphy - 70365

Last update 08-02-2021

HU Credits: 3

Degree/Cycle: 1st degree (Bachelor)

Responsible Department: Geology

Academic year: 0

Semester: 2nd Semester

Teaching Languages: Hebrew

Campus: E. Safra

Course/Module Coordinator: Prof Zohar Gvirtzman

Coordinator Email: zohar@gsi.gov.il

Coordinator Office Hours: By appointment

Teaching Staff:

Prof Zohar Gvirtzman,
Ms. Laor May

Course/Module description:
The course will begin with a brief summary of classic stratigraphic principles like facies variations in time and space, litho- bio- and chrono-stratigraphy, and geologic time. Second part of the course will deal with principles of sequence stratigraphy emphasizing the influence of tectonics, eustasy, and sedimentary supply on basin-fill processes. Third part of the course will deal with mechanisms that form sedimenatry basins distinguishing deep seated tectonic processes from the isostatic response of the lithosphere to sedimentary loading. A special emphasize will be given to extensional basins (McKenzie model), quantitative subsidence analysis, and reconstruction of thermal history.

Course/Module aims:
(1) Basic concepts of stratigraphy; (2) basin forming mechanisms; (3) basin filling processes; (4) understand the interaction between sedimentary and tectonic processes.

Learning outcomes - On successful completion of this module, students should be able to:
On successful completion of this module, the students should be able to : (1) correlate stratigraphic sections, (2) to analyse maps, sections, thickness variations, and thickness-time diagrams, (3) to perform a quantitative subsidence analysis including the distinction between sedimentary loading and tectonics, (4) to calculate subsidence as a function of extension.

Attendance requirements(%):
None

Teaching arrangement and method of instruction: Lectures and exercises

Course/Module Content:
Part I: The stratigraphic record in time and space
Stratigraphic units
The geological Time Table
Subsurface maps

Part II: Basin filling processes
Lateral thickness variations

Principles of Sequence stratigraphy
Global sealevel changes

Part III: Basin forming processes
Principle of isostasy
Quantitative analysis of subsidence history (backstripping and sedimentary unloading)
Extensional basins

Required Reading:

1. Krumbein and Sloss, 1963, Stratigraphy and Sedimentation.

2. Miall, A., 1990, Principles of Sedimentary Basins, Springer-Verlag.

3. Emery, D., and Myers, K.J., 1996, Sequence Stratigraphy, Blackwell.

4. Coe, L., 2003, The Sedimentary Record of Sea-Level Change, Cambridge University Press, Cambridge Open University.

5. Allen , P.A., and Allen, J.R., 1990, Basin Analysis, Principles and Applications, Blackwell. (a newer edition in Library)

6. Einsel, G., 1992, Sedimentary Basins, Evolution, Facies, and Sediment Budjet, Springer-Verlag

Additional Reading Material:

None

Course/Module evaluation:

End of year written/oral examination 70 %
Presentation 0 %
Participation in Tutorials 0 %
Project work 0 %
Assignments 30 %
Reports 0 %
Research project 0 %
Quizzes 0 %
Other 0 %

Additional information:

None