



SEDIMENTOLOGY OF CLASTIC RESERVOIRS

Petroleum Geoengineering MSc
2022/23 II. Semester

MFFTT720005

COURSE COMMUNICATION FOLDER

University of Miskolc
Faculty of Earth and Environmental Sciences and Engineering
Institute of Exploration Geosciences

COURSE DATASHEET

Course Title: Sedimentology of clastic reservoirs	Credits: 3
Type (lec. / sem. / lab. / consult.) and Number of Contact Hours per Week: lec. 2, sem. 1	
Neptun code: MFFTT720005	
<p>Type of Assessment (exam. / pr. mark. / other): exam Signature's requirement: participation on lectures (zero unjustified absence) + seminar exercises + at least one pass mark test paper. Written examination: recommended mark based on test paper, in case of disagreement oral examination.</p> <p>Grading limits: >81 %: excellent, 71-80 %: good, 61-70 %: medium, 50-60 %: satisfactory, <50 %: unsatisfactory.</p>	
Position in Curriculum (which semester): second	
Pre-requisites (<i>if any</i>): Applied petrology, Introduction to petrophysics.	
Course Description:	
<p>Acquired store of learning: <u>Study goals:</u> Sedimentology is concerned with the composition and genesis of sediments and sedimentary rocks. The subject gives tools and methods for the understanding and interpretation of sediments, their facies and spatial distribution. Facies models makes possible to predict distribution of facies of different origin thus helping exploration. The course gives also a comprehensive outline of the different methods of subsurface geology, which is of major importance in hydrocarbon exploration and water prospecting.</p> <p><u>Course content:</u> Sedimentology as an earth science: introduction and principles. Dimensions of geological knowledge. Harmonizing different scales (mega-, macro, and micro scales) of data. Subsurface geology: tools and available data. Seismic, well-logs, cores and others. Factors controlling the nature and distribution of facies: sedimentary processes, supply, climate, tectonics and sea-level changes. Understanding of processes of deposition through sedimentary structures – characteristic of depositional processes. Applied geophysical methods: well (wireline) logs used for lithological and facies interpretation. Definition of facies, facies associations, and facies models. Definition of depositional environments. Relations between facies and depositional environments. Depositional systems: classification of depositional environments Detailed description of the individual clastic depositional environments (terrestrial environments, coastal and nearshore environments, marine environments), their processes and facies distribution. Understanding of depositional architecture in a mega (basin) and macro scale. Palaeogeographic reconstruction – how ancient environments can be reconstructed.</p> <p><u>Education method:</u> Presentations by Powerpoint. Basic practice in geologic well log interpretation.</p> <p>Competencies to evolve:</p> <ul style="list-style-type: none"> • Ability to participate in PhD programs in case of fulfillment of law or regulations determined by the institution. • Intuition, systematism, learning skill. • Demand for continual renewal of technical skills 	
The 3-5 most important compulsory, or recommended literature (textbook, book) resources:	

- Harold G. Reading 2006: Sedimentary Environments: Processes, Facies and Stratigraphy, Wiley, London, p.704.
- Walker R.G.: Facies Models, 1984: Geoscience Canada p.317
- S. Boggs: Principles of Sedimentology and Stratigraphy, Prentice Hall Publishing, 2011. ISBN-10: 0321643186 | ISBN-13: 978-0321643186.
- G. Nichols: Sedimentology and Stratigraphy. Wiley-Blackwell, 2009. ISBN: 978-1-4051-3592-4.
- Mike R. Leeder, 2011: Sedimentology and Sedimentary Basins: From Turbulence to Tectonics. John Wiley & Sons, p. 784
- G. P. Allen, A. Coadou, F. Mercier: Clastic Reservoir Sedimentology: A Practical Course on Log-based Sedimentological Analysis of Fluvial, Deltaic, and Coastal Clastic Reservoirs. (S.I.) Clastic sedimentology section, Total exploration laboratory, 1992.

Responsible Instructor(*name, position, scientific degree*):

Györgyi Juhász Dr., PhD (MOL Group)

Other Faculty Member(s) Involved in Teaching, if any (*name, position, scientific degree*):

Syllabus of the semester

Monday, 9:00 – 12:00

<i>Date</i>	<i>Lecture</i>
2023.02.27.	Sedimentology as an earth science: introduction and principles. Dimensions of geological knowledge. Factors controlling the nature and distribution of facies. Definition of depositional environments and facies, theory of facies models.
2023.03.06.	Overview of sedimentary structures. Subsurface geology: tools and available data. Seismic, well-logs, cores and others. Harmonizing different scales (mega-, macro, and micro scales) of data.
2023.03.13.	Depositional systems: classification of depositional environments Overview of the individual clastic depositional environments (terrestrial or continental environments, coastal and nearshore environments, marine environments).
2023.03.20.	Detailed description of Coarse alluvial sediments. Their significance in HC exploration.
2023.03.27.	Detailed description of Fluvial environments and facies. Their significance in HC exploration.
2023.04.03.	Detailed description of Siliciclastic shorelines and deltaic environments and their facies. Their significance in HC exploration.
2023.04.10.	Holiday
2023.04.17.	Detailed description of Deltaic environments and facies. Their significance in HC exploration.
2023.04.25.	Detailed description of shelves and slopes. Their significance in HC exploration.
2023.05.01.	Holiday
2023.05.08.	Detailed description of deep-water turbidites. Their significance in HC exploration.
2023.05.15.	Detailed description of contourites. Their significance in HC exploration.
2023.05.22.	Understanding of depositional architecture in a mega (basin) and macro scale. Palaeogeographic reconstruction – how ancient environments can be reconstructed. Case study on the Pannonian Basin.
2023.05.29.	Holiday

EXAM

1. What are the main sedimentary structures (stratification types, deformational structures) in clastic sediments?
2. What are the main well log motifs in sedimentologic well-log interpretation to consider?
3. What kind of deep-water / deltaic / fluvial facies models do you know? What are the basics of the e.g. Walker turbidite facies model?
4. What is the significance of deep-water turbidites / deltaic- / fluvial sediments in terms of hydrocarbon exploration?