



SEDIMENTOLOGY OF CLASTIC RESERVOIRS

Petroleum Geoengineering MSc
2018/19 II. Semester

MFFTT720005

COURSE COMMUNICATION FOLDER

University of Miskolc
Faculty of Earth Science and Engineering
Institute of Mineralogy and Geology

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 | |
| Type of Assessment (exam. / pr. mark. / other): exam Signature's requirement: participation on lectures (zero unjustified absence) + at least one pass mark test paper. Written examination: recommended mark based on test paper, in case of disagreement oral examination. | |
| Grading limits: >89 %: excellent, 76-88 %: good, 63-75 %: medium, 50-62 %: satisfactory, <50 %: unsatisfactory. | |
| Position in Curriculum (which semester): second | |
| Pre-requisites (<i>if any</i>): Applied petrology, Introduction to petrophysics. | |
| Course Description: | |
| 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. <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. Processes of deposition: weathering, transportation, sedimentation. Outline of sedimentary petrology: composition, texture and sedimentary structures. 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 or continental environments, coastal and nearshore environments, marine environments). Understanding of depositional architecture in a mega (basin) and macro scale. Palaeogeographic reconstruction – how ancient environments can be reconstructed. Understanding of softwares helping the sedimentological interpretation in subsurface geology. <u>Education method:</u> Presentations by projector. Basic practice in geologic well log interpretation. | |
| Competencies to evolve: T1, T2, T4, T5, T6, T8, T12, K1, K5, K9 | |
| The 3-5 most important compulsory, or recommended literature (textbook, book) resources: | |
| <ul style="list-style-type: none">• Balogh Kálmán (szerk.): Szedimentológia. Akadémiai kiadó, Budapest, 1991.• Bérczi István, Jámbor Áron (szerk.): Magyarország geológiai képződményeinek rétegtana. A MOL RT. és a MÁFI kiadványa, Budapest, 1988. | |

- 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.
- 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

Thursday, 12:00 – 15:00

| <i>Date</i> | <i>Lecture</i> |
|-------------|--|
| 2019.02.14. | Sedimentology as an earth science: introduction and principles. |
| 2019.02.21. | Dimensions of geological knowledge. |
| 2019.02.28. | Harmonizing different scales (mega-, macro, and micro scales) of data. |
| 2019.03.07. | Subsurface geology: tools and available data. Seismic, well-logs, cores and others. |
| 2019.03.14. | Processes of deposition: weathering, transportation, sedimentation. Outline of sedimentary petrology: composition, texture and sedimentary structures. |
| 2019.03.21. | Factors controlling the nature and distribution of facies: sedimentary processes, supply, climate, tectonics and sea-level changes. |
| 2019.03.28. | Understanding of processes of deposition through sedimentary structures – characteristic of depositional processes. Applied geophysical methods: well (wireline) logs used for lithological and facies interpretation. |
| 2019.04.04. | Definition of facies, facies associations, and facies models. |
| 2019.04.11. | Definition of depositional environments. |
| 2019.04.18. | Relations between facies and depositional environments. |
| 2019.04.25. | Depositional systems: classification of depositional environments Detailed description of the individual clastic depositional environments (terrestrial or continental environments, coastal and nearshore environments, marine environments). |
| 2019.05.02. | Understanding of depositional architecture in a mega (basin) and macro scale. |
| 2019.05.09. | Holiday |
| 2019.05.16. | Palaeogeographic reconstruction – how ancient environments can be reconstructed. Understanding of softwares helping the sedimentological interpretation in subsurface geology |

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 turbidite models do you know? What is the basics of the Walker turbidite facies model?
4. What is the significance of deep-water turbidites in terms of hydrocarbon exploration?