SYLLABUS

Sedimentology

University year 2025-2026

1. Information regarding the programme

1.1. Higher education institution	Babeş-Bolyai University
1.2. Faculty	Faculty of Biology and Geology
1.3. Department	Department of Geology
1.4. Field of study	Geology
1.5. Study cycle	Masters
1.6. Study programme/Qualification	Subsurface Energy Resources / Geologist
1.7. Form of education	With attendance

2. Information regarding the discipline

2.1. Name of the discipline	Sedimentology					Discipline code	**BME1123**
2.2. Course coordinator					Săsăran Emanoil, PhD		
2.3. Seminar coordinator					Săsăran Emanoil, PhD		
2.4. Year of study	I	2.5. Semester	2	2.6. Type of evaluation	E	2.7. Discipline regime	O

3. Total estimated time (hours/semester of didactic activities)

3.1. Hours per week	**4**	of which: 3.2 course	**2**	3.3 seminar/laboratory	**2**
3.4. Total hours in the curriculum	56	of which: 3.5 course	28	3.6 seminar/laborator	**28**
Time allotment for individual study (ID) and self-study activities (SA)					**hours**
Learning using manual, course support, bibliography, course notes (SA)					40
Additional documentation (in libraries, on electronic platforms, field documentation)					20
Preparation for seminars/labs, homework, papers, portfolios and essays					20
Tutorship					13
Evaluations					5
Other activities:					
3.7. Total individual study hours	**98**				
3.8. Total hours per semester	**154**				
3.9. Number of ECTS credits	**6**				

4. Prerequisites (if necessary)

4.1. curriculum	Sedimentary petrology, magmatic and metamorphic petrology, paleontology, facies analysis, stratigraphy
4.2. competencies	Use of microscope and computer

5. Conditions (if necessary)

5.1. for the course	Face to face activities
5.2. for the seminar /lab activities	Microscopy laboratory, laboratory for preparing and processing samples, laboratory for making thin sections, didactic collection of the Sedimentology discipline, museum and library of the Department of Geology.

6.1. Specific competencies acquired [1]

[1] One can choose either competences or learning outcomes, or both. If only one option is chosen, the row related to the other option will be deleted, and the kept one will be numbered 6.

Professional/essential competencies	• - Identification of environments and depositional systems in field conditions; • - Understanding the mechanisms and depositional dynamics at different scales of sediment organization; • - Prediction of the nature and location of sedimentary bodies; • - Recognition and identification of depositional cycles in field or laboratory conditions • - Identification of different types of aggregates or sedimentary rocks regarding the possibility of their use in industry;
Transversal competencies	• - use of knowledge for disciplines that have as object of study: stratigraphy, prospecting and geological explorations, useful mineral substances, hydrocarbons, sedimentary basins, oil exposures, etc.

7. Objectives of the discipline (outcome of the acquired competencies)

7.1 General objective of the discipline	• - Definition of parasequences, parasequence sets and siliciclastic and carbonate depositional sequences
7.2 Specific objective of the discipline	• The SEDIMENTOLOGY discipline deepens the current and non-current exogenous depositional systems, through the prism of facies, facies associations, facies successions and existing depositional environments. The chaining of contemporary siliciclastic and carbonate depositional systems will define the sedimentary processions (systems tracts), by their position in the depositional sequence and by the way of overlapping of the parasequences and sets of parasequences, limited by marine flood surfaces. Modeling of sedimentary processions and carbonate depositional sequences is predictive, as it indicates how major carbonate platform types and associated deposition systems change, occur, and disappear, depending on the response to relative sea level changes. Siliceous and carbonate sedimentology is an analytical and predictive method of simulating the filling of a basin, at different spatial or temporal scales. The general purpose in sedimentology is to find in sediments the different orders of rupture in sedimentation or rhythms, packed in time and space. This approach applied to facies sedimentology allows access to: • - a high resolution geometry of sedimentary basins; • - an understanding of the mechanisms and depositional dynamics at different scales of sediment organization; • - prediction of the nature and location of sedimentary bodies; • - a dynamic model that explains the transfer of material from a source to an available space to accept it.

8. Content

8.1 Course	Teaching methods	Remarks
1. Introduction: field of study and methods of analysis in siliciclastic and carbonate sedimentology.	Presentation, discussions, case studies	
2. Stratral units; lamina, set of laminae, layer and set of layers: definitions, characteristics of hierarchically inferior units, depositional processes, characteristics of limiting surfaces.		

3. Factors that control the nature and distribution of siliciclastic and carbonate facies: sedimentary processes, sediment input, climate, tectonics, sea level changes, biological activity, water chemistry.		
4. Eustasy, relative sea level and water depth: glacio-eustatic changes and tectono-eustatic changes.		
5. Sea level changes due to orbital controlled climate cycles: IV and V-Milankovitch cycles.		
6. The concept of accommodation, the significance of inflection points, the basic level and the notion of sedimentary flow in a closed system.		
7. Parasequences and sets of siliciclastic and carbonate parasequences: prograde, degrees and retrogrades.		
8. Siliciclastic and carbonate depositional sequence; type I and II sequences in passive margin shells; recognition of regional (eustatic) or local (tectonic) events in the evolution of relative sea level. 9.Modeled depositional sequences for barred shells and ramps: wet carbonate barred shell and ramp.		
8.2 Seminar / laboratory	Teaching methods	Remarks
1. Case studies prepared for the students	Presentation, case studies, discussions, exercises	
2. Practical tests		

Bibliography

Catuneanu, O., 2006. Principles of Sequence Stratigraphy. Elsevier, Amsterdam. 375 pp.

Schlager, W., 2005. Carbonate Sedimentology and Sequence Stratigraphy. Concepts in Sedimentology and Paleontology #8. Society of Economic Paleontologists and Mineralogists (SEPM). 200 pp.

Sea level changes. An integrated approach. S.E.P.M., Spec.Publ., 42, 1988.

Loucks, R.G. & Sarg, J.F. (1993) – Carbonate sequence stratigraphy; Recent developments and applications. AAPG Memoir, 57, Tulsa, 545p.

Posamentier, H.W., Allen, G.P., 1999. Siliciclastic sequence stratigraphy: concepts and applications. Concepts in Sedimentology and Paleontology, vol. 7. Society of Economic Paleontologists and Mineralogists (SEPM). 210 pp.

Van Vagoner J.C., Mitchum R.M., Posamentier, H.W., Vail P.R. (1987) - Seismic stratigraphy interpretation using sequence stratigraphy. In "Atlas of seismic stratigraphy", ed. A.W. Bally, Ammer. Assoc. Petrol. Geol. Studies in Geology, 27.

McIlreath, J. A., James, N. P., 1984 – Carbonate slopes. In: Walker R. G. (ed), Facies models, 2nd ed. Geol. Assoc. Can., Geosci.. Reprint Ser 1, p. 245-257.

Scholl, P.A., Bebout, D.G. & Moore, C.H. (1983) – Carbonate depositional environments. AAPG, Mem. 33, 691p.

Tucker, M. E. and Wright, V. P., 1990 – Carbonate Sedimentology. Oxford, Blackwell Scientific Publications, 482p.

Flügel, E. (2004) – Microfacies of carbonate rocks. Analysis, interpretation and application. Springer. 976 p.

Reading, H.G. (1986) - Sedimentary Environments and facies. (Second edition), Blackwell Sci. Publ, 615p.

Walker, R.G., James, N.P.(edt) (1992) - Facies Models. Response to Sea Level Change. Geol. Assoc. Canada, 410p.

Galloway W.E., Hobday D.K.(1983) - Terrigenous Clastic Depositional Systems. Aplications to Petroleum, Coal and Uranium Exploration. Ed. Springer-Verlag.

9. Corroborating the content of the discipline with the expectations of the epistemic community, professional associations and representative employers within the field of the program

- The lectures and lab activities are designed and updated to give the students the necessary scientific knowledge and practical abilities required by the professional environment.

10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percentage of final grade
10.4 Course	Assessment of knowledge	Written exam	50%
10.5 Seminar/laboratory	Activity during seminars	Discussions	10%
	Assessment of knowledge	Practical tests	40%
10.6 Minimum standard of performance			
• 50% of the subjects required by the written exam • 50% of the practical test			

11. Labels ODD (Sustainable Development Goals)[2]

	Not applicable.							

Date:
31.03.2025

Signature of course coordinator

Associate professor Dr. Săsăran Emanoil

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Signature of seminar coordinator

Associate professor Dr. Săsăran Emanoil

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Date of approval:
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Signature of the head of department

Associate professor Dr. Har Nicolae, PhD

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[2] Keep only the labels that, according to the *Procedure for applying ODD labels in the academic process*, suit the discipline and delete the others, including the general one for *Sustainable Development* – if not applicable. If no label describes the discipline, delete them all and write „*Not applicable*.".