SYLLABUS

Applied geochemistry

University year 2025-2026

1. Information regarding the programme

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

2. Information regarding the discipline

2.1. Name of the dis	scipli	ne Applied g	eoch	emistry			Discipline code	BME1114
2.2. Course coordir	nator				Boglárl	a-Merce	desz Kis, PhD	
2.3. Seminar coordinator			Boglárka-Mercedesz Kis, PhD					
2.4. Year of study	1	2.5. Semester	1	2.6. Type of evaluation	on VP	2.7. Di	iscipline regime	0

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	3.4. Total hours in the curriculum56of which: 3.5 course283.6 seminar/laborator					
Time allotment for individual study (ID) and self-study activities (SA)						
Learning using manual, course support, bibliography, course notes (SA)						
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 hours98						
3.8. Total hours per semester154						
3.9. Number of ECTS credits 6						

4. Prerequisites (if necessary)

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4.1. curriculum	
4.2. competencies	

5. Conditions (if necessary)

5.1. for the course	Face to face activities			
5.2. for the seminar /lab activities	Face to face activities			

6. 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.

Transversal	Professional/essential
competencies	competencies
 Acquiring some basic knowledge on the geochemistry of fluids from hydrocarbon systems The use of theoretical knowledge in solving specific practical problems and data interpretation 	 Ability to recognize geochemical processes in the generation of fluids in hydrocarbon systems; Ability to differentiate between types of fluids in hydrocarbon systems Ability to use different methodologies in field in laboratory for the analysis of fluids Ability to interpret data and information gathered on the field and in laboratory

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

7.1 General objective of the discipline	• Acquiring basic knowledge on the geochemistry of fluids in hydrocarbon systems.		
7.2 Specific objective of the	 Learning the principles of geochemistry in the formation and genesis of fluids in hydrocarbon systems Learning the types of fluids in hydrocarbon systems 		
discipline	 Practical applications and exercises in the study of fluids 		
	 Learning through cases studies and examples 		

8. Content

8.1 Course	Teaching methods	Remarks
1. Introduction	Interactive presentation	
2. Geochemistry of source rocks	Interactive presentation	
3. Geochemical processes in the genesis of fluids in hydrocarbon systems	Interactive presentation	
4. Petroleum: geochemical characteristics	Interactive presentation	
5. Methane: geochemical characteristics	Interactive presentation	
6. Higher hydrocarbons: geochemical characteristics	Interactive presentation	
7. Carbon dioxide: geochemical characteristics	Interactive presentation	
8. Hydrogen: geochemical characteristics	Interactive presentation	
9. Isotope geochemistry of hydrocarbons	Interactive presentation	
10 Noble gases in hydrocarbon systems	Interactive presentation	
11. Hydrogeochemistry of formation water	Interactive presentation	
12. Prospecting with gas geochemistry	Interactive presentation	
Bibliography Chilingar, G.V., Buryakovsky, L.A., Eremenko, N.A., Gorfunkel, M.V. 2005, Geology and Geochemistry of oil and gas, Elsevier, Amsterdam		

Dembicki, H., 2017, Practival petroleum		
geochemistry for exploration and		
production, Elsevier, United Kingdom		
Gene Collins, A., 1975, Geochemistry of oilfield		
waters, Elsevier, Amsterdam		
Welte, D.H., Horsfield, B., Baker, D.R., 1997,		
Petroleum and basin evolution-insights from		
petroleum geochemistry, geology and basin		
modeling, Springer, Heidelberg		
8.2 Seminar / laboratory		Teach
1.Practical exercises for gas analyses: CH4	Exercises	
2. Practical exercises for gas analyses:CO2	Exercises	
3. Practical exercises for gas analyses:H2	Exercises	
4. Practical exercises for gas analyses:H2S	Exercises	
5. Practical exercises for water analyses	Exercises	
6.Case studies	Exercises	
Bibliography		
Chilingar, G.V., Buryakovsky, L.A., Eremenko,		
N.A., Gorfunkel, M.V. 2005, Geology and		
Geochemistry of oil and gas, Elsevier,		
Amsterdam		
Dembicki, H., 2017, Practival petroleum		
geochemistry for exploration and		
production, Elsevier, United Kingdom		
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petroleum geochemistry, geology and basin		
modering, Springer, Heidelberg		_

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 course knowledge	Examination during the semester	70%		
10.5 Seminar/laboratory	Filling the exercise textbook	Examination during the semester	30%		
10.6 Minimum standard of performance					
 60% of course material Filled textbook minimum 80% 					

11. Labels ODD (Sustainable Development Goals)²



Date of approval: 27.03.2025

Signature of the head of department

Conf.dr.Nicolae Har

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."*.