SYLLABUS

Fluid 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 discipline	**Fluid Geochemistry**					Discipline code	**BME1115**
2.2. Course coordinator				Boglárka-Mercedesz 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	VP	2.7. Discipline 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	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	
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.

Professional/essential competencies	• 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
Transversal 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

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 discipline	• Learning the principles of geochemistry in the formation and genesis of fluids in hydrocarbon systems • Learning the types of fluids in hydrocarbon systems • 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 to the geochemistry of fluids in hydrocarbon systems	Interactive presentation	
2. Geochemical processes in the genesis of fluids in hydrocarbon systems	Interactive presentation	
3. Geochemical classification 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	Teaching methods	Remarks
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 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		

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]

	General label for Sustainable Development							
								

[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.*".

Date:
27.03.2025

Signature of course coordinator

Boglárka-Mercedesz Kis PhD.

Signature of seminar coordinator

Boglárka-Mercedesz Kis PhD.

Date of approval:
27.03.2025

Signature of the head of department

Conf.dr.Nicolae Har