

SYLLABUS

Introduction to petroleum systems

University year **2025-2026**

1. Information regarding the programme

1.1. Higher education institution	Universitatea Babeş-Bolyai din Cluj Napoca
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	Învăţământ cu frecvenţă

2. Information regarding the discipline

2.1. Name of the discipline		Introduction to petroleum systems					Discipline code		BME1111			
2.2. Course coordinator					Volker Schuller, Cristian Victor Mircescu							
2.3. Seminar coordinator					Volker Schuller, Cristian Victor Mircescu							
2.4. Year of study		1	2.5. Semester		1	2.6. Type of evaluation		E	2.7. Discipline regime		DF	

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
3.5.1. Learning using manual, course support, bibliography, course notes (SA)					40
3.5.2. Additional documentation (in libraries, on electronic platforms, field documentation)					20
3.5.3. Preparation for seminars/labs, homework, papers, portfolios and essays					20
3.5.4. Tutorship					13
3.5.5. Evaluations					5
3.5.6. 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	Fundamentals in structural and sedimentary geology
4.2. competencies	Use of microscope and computer

5. Conditions (if necessary)

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

6.1. Specific competencies acquired ¹

Professional/essential competencies	<ul style="list-style-type: none">• Ability to recognize and describe the elements of petroleum systems• Ability to decipher the relationship between the most important elements of petroleum systems and how they influence hydrocarbon exploration• Ability to define source, maturity, migration charge, and timing• Storage and deliverability of subsurface fluids• Ability to write reports and scientific papers
Transversal competencies	<ul style="list-style-type: none">• The use of theoretical knowledge in solving specific practical problems• Acquiring theoretical and practical knowledge which can be used to understand the evolution of petroleum systems• Understand the thermo-kinematic evolution of a sedimentary basin• Basics on reservoir dynamics

6.2. Learning outcomes

Knowledge	The student knows: how to analyse petroleum system development
Skills	The student is able to identify the key elements of petroleum systems and the relationship between them
Responsibility and autonomy:	The student has the ability to work independently in order to obtain a general image on the evolution of petroleum systems

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

7.1 General objective of the discipline	<ul style="list-style-type: none">• Understanding the evolution and mechanisms controlling petroleum system development
7.2 Specific objective of the discipline	<ul style="list-style-type: none">• Construct Petroleum Systems Event Charts (PSEC) to be used for interpretation of basin dynamics• Risk assessment on and quantify is uncertainty of Each Petroleum system Element and timing• Reservoir properties and fluid dynamics

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.

8. Content

8.1 Course	Teaching methods	Remarks
1.Introduction to Petroleum Systems	Presentation, discussions, case studies	-
2-3. Source rocks	Presentation, discussions, case studies	-
4-5. Migration, charge	Presentation, discussions, case studies	-
6-7. Seal	Presentation, discussions, case studies	-
8-9. Trapping	Presentation, discussions, case studies	-
10-11. Reservoir	Presentation, discussions, case studies	-
12-13. Timing – Petroleum System Elements Analysis	Presentation, discussions, case studies	-
14. Examples from around the world	Presentation, discussions, case studies	-
Bibliography		
The Petroleum System—From Source to Trap: Leslie B. Magoon, Wallace G. Dow; Publisher: AAPG, 1994.		
Petroleum and Basin Evolution: Dietrich H. Welte; Brian Horsfield; Donald R. Baker, Springer 2011.		
8.2 Seminar / laboratory	Teaching methods	Remarks
1-13. Examples of petroleum systems and relation between key elements of petroleum systems	Presentation, case studies, discussions, exercises	-
14. Practical tests	Presentation, case studies, discussions, exercises	-
Bibliography		
The Petroleum System—From Source to Trap: Leslie B. Magoon, Wallace G. Dow; Publisher: AAPG, 1994.		
Petroleum and Basin Evolution: Dietrich H. Welte; Brian Horsfield; Donald R. Baker, Springer 2011.		



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 examination	50%
10.5 Seminar/laboratory	Laboratory activities	Discussions	10 %
	Assessment of knowledge	Practical tests	40 %
10.6 Minimum standard of performance			
<ul style="list-style-type: none">50% of the subjects required by the written exam50% of the practical test			

11. Labels ODD (Sustainable Development Goals)²

	General label for Sustainable Development							
								
								

Date:
26.03.2024

Signature of course coordinator
Şef lucrări dr. Mircescu Cristian Victor

Signature of seminar coordinator
Şef lucrări dr. Mircescu Cristian Victor

Dr. Volker Schuller

Dr. Volker Schuller

Date of approval:
28.03.2025

Signature of the head of department

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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.*”.