COURSE DESCRIPTION

Metallogeny Models

Academic year 2025-2026

1. Programme-related data

1.1. Higher Education Institution	Babeş-Bolyai University
1.2. Faculty	Faculty of Biology and Geology
1.3. Doctoral Shool	Theoretical and Applied Geology
1.4. Field of study	Geology
1.5. Level of study	Doctorate

2. Course-related data

2.1. Course title	**Metallogeny Models**			Course code	**SDG07**
2.2. Course coordinator	Assoc. Prof. habil, PhD Călin Gabriel Tămaş				
2.3. Seminar coordinator	Assoc. Prof. habil, PhD Călin Gabriel Tămaş				
2.4. Year of study	1	2.5. Semester	2	2.6. Type of assessment	Exam
2.7. Course status	Optional			2.8. Course type	Specialisation subject

3. Total estimated time (hours per semester of teaching activities)

3.1. Number of hours per week	**4**	of which: 3.2. course	**2**	3.3. seminar/ laboratory/ project	**2**
3.4. Total of hours in the curriculum	48	of which: 3.5. course	24	3.6. seminar/ laboratory	**24**
Time allocation for individual study (IS) and self-taught activities (ST)					**hours**
Learning from textbooks, course materials, bibliography, and notes (IS)					60
Additional research in the library, on subject-specific electronic platforms, and on-site					56
Preparing seminars/ laboratories/ projects, assignments, reports, portfolios, and essays					60
Tutoring (professional guidance)					24
Examinations					2
Other activities					0
3.7. Total hours of individual study (IS) and self-taught activities (ST)				**202**	
3.8. Total hours per semester				**250**	
3.9. Number of credits				**10**	

4. Prerequisites (where applicable)

4.1. curriculum-related	Mineralogy, Physical methods of analysis, Magmatic petrology, Metamorphic petrology, Ore deposits, Metallogeny
4.2 skills-related	Use of references databases

5. Specific conditions (where applicable)

5.1. course-related	Video support
5.2. seminar/laboratory-related	Case Studies Attendance of at least 80% of laboratory classes

6. Subject-specific learning outcomes

Knowledge
1. Advanced knowledge in the field of Geology (identification of ore deposit genetic types)
2. Ability to identify, formulate and creatively solve exploration challenges (identifying the controlling factors of ore deposit formation and evaluating their importance in geological exploration activity)

3. Mastering of advanced research methods and techniques in Geology (identification of vectors towards mineralization and their interpretation in order to establish the proximity of ore bodies)
4. Mastering new approaches to solving research challenges (acquiring a modern, petrographic-metallogenetic integrative vision of the processes leading to the formation of ore deposits)
5. Ability to process data at an advanced level (ability to outline a metallogenetic model and update it in accordance with new geological information generated through exploration)
Skills
1. applying theoretical knowledge in laboratory and field work activities
2. using documentary sources in professional activity
3. ability to synthesize relevant geological and reservoir information and create reservoir models
Responsibility and autonomy
1. Mastering of critical thinking and reasoning analysis (ability to analyze and synthesize information about geological phenomena and processes with metallogenetic potential)
2. Collaboration and teamwork skills (acquiring and applying an efficient approach to fieldwork and research in a team and/or individually, by achieving objectives, meeting deadlines and exploiting research results)
3. Advanced digital skills (ability to routinely use analytical equipment and specialized software for geological data production, processing and interpretation)
4. Written and oral communication skills for presenting own scientific results or geological data from literature/industry (creation/writing of scientific/technical documentation)

7. Contents

7.1. Course	**Teaching and learning methods**	**Remarks[1]**
The concept of ore deposit models, origin and evolution	Presentation, discussion, case studies	
Metallogeny models by USGS (1986) and updated versions until 2017	Presentation, discussion, case studies, exercises	
Case studies on ore deposit genetic types and correspondence with available models	Presentation, discussion, case studies, exercises	

Bibliography

Bradley, D., Munk, L., Jochens, H., Hynek, S., Labay, K., 2013, A preliminary deposit model for lithium brines: U.S. Geological Survey Open-File Report 2013–1006, 6 p.

Cox, D.P., Singer, D.A. (eds.), 1986. Mineral Deposit Models. U.S. Geological Survey Bulletin 1693

Drew, L.J., 2005. A tectonic model for the spatial occurrence of porphyry copper and polymetallic vein deposits. Applications to central Europe: U.S. Geological Survey Scientific Investigations Report 2005–5272, 36 p.

John, D.A., Ayuso, R.A., Barton, M.D., Blakely, R.J., Bodnar, R.J., Dilles, J.H., Gray, F., Graybeal, F.T., Mars, J.C., McPhee, D.K., Seal, R.R., Taylor, R.D., Vikre, P.G., 2010, Porphyry copper deposit model, chap. B of Mineral deposit models for resource assessment: U.S. Geological Survey Scientific Investigations Report 2010–5070–B, 169 p.

Ludington, S., Barton, P.B., Johnson, K.M., 1985, Mineral deposit models: theory and practice, USGS Open-file report 85-391, 18 p.

Shanks, W.C. Pat, III, Thurston, R. (eds.), 2012, Volcanogenic massive sulfide occurrence model: U.S. Geological Survey Scientific Investigations Report 2010–5070–C, 345 p.

Taylor, C.D., Causey, J.D., Denning, P.D., Hammarstrom, J.M., Hayes, T.S., Horton, J.D., Kirschbaum, M.J., Parks, H.L., Wilson, A.B., Wintzer, N.E., Zientek, M.L., 2013, Descriptive models, grade-tonnage relations, and databases for the assessment of sediment-hosted copper deposits—With emphasis on deposits in the Central African Copperbelt, Democratic Republic of the Congo and Zambia: U.S. Geological Survey Scientific Investigations Report 2010–5090–J, 154 p. and data files.

[1] For example, organisational aspects, recommendations for students, specific aspects relating to the course/seminar, such as inviting experts in the field, etc.

Taylor, R.D., Hammarstrom, J.M., Piatak, N.M., Seal, R.R. II, 2012, Arc-related porphyry molybdenum deposit model, Chapter D of Mineral deposit models for resource assessment: U.S. Geological Survey Scientific Investigations Report 2010–5070–D, 64 p.		
7.2. Seminar/ laboratory	**Teaching and learning methods**	**Remarks**
Case studies prepared with the doctoral students, based on their individual doctoral research topics	Presentation, discussion, exercises	
Bibliography The specific bibliography for each topic is established according to the research topic of each doctoral student.		

8. Evaluation

Type of activity	8.1 Evaluation criteria[2]	8.2 Evaluation methods[3]	8.3 Percentage in the final grade
8.4. Course	Assessment of knowledge	Oral examination	70%
	Assessment of knowledge	Ongoing evaluation	30%
8.5. Seminar/ laboratory	Activity during seminars	Discussions, answers to questions	30%
	Assessment of knowledge	Oral examination	70%
8.6 Minimum standard for passing			
Passing the theoretical exam Passing the knowledge exam regarding the metallogenetic framework of the doctoral research topic, including the geotectonic setting and geochronology of the area of interest for the PhD research topic			

9. SDG labels (Sustainable Development Goals)[4]

	○ Sustainable Development Generic Label							
1 FĂRĂ SĂRĂCIE	2 FOAMETE „ZERO"	3 SĂNĂTATE ȘI BUNĂSTARE	4 EDUCAȚIE DE CALITATE	5 EGALITATE DE GEN	6 APĂ CURATĂ ȘI SANITAȚIE	7 ENERGIE CURATĂ ȘI LA PREȚURI ACCESIBILE	8 MUNCĂ DECENTĂ ȘI CREȘTERE ECONOMICĂ	9 INDUSTRIE, INOVAȚIE ȘI INFRASTRUCTURĂ
○	○	○	○	○	○	○	○	○
10 INEGALITĂȚI REDUSE	11 ORAȘE ȘI COMUNITĂȚI DURABILE	12 CONSUM ȘI PRODUCȚIE RESPONSABILE	13 ACȚIUNE CLIMATICĂ	14 VIAȚA ACVATICĂ	15 VIAȚA TERESTRĂ	16 PACE, JUSTIȚIE ȘI INSTITUȚII EFICIENTE	17 PARTENERIATE PENTRU REALIZAREA OBIECTIVELOR	No label applies
○	○	○	○	○	○	○	○	○

[2] The evaluation criteria must directly reflect the learning outcomes targeted at the level of the degree programme respectively at the level of the subject. More specifically, the learning outcomes set out in the expected learning outcomes are assessed.

[3] Both final evaluation methods and ongoing evaluation strategies should be established.

[4] Select a single label which, according to the *Implementation of SDG labels in the academic process*, best matches the subject. If the subject addresses sustainable development in a generic manner (i.e. by presenting/introducing the general framework of sustainable development, etc.), then the Sustainable Development generic label may be applied. If none of the labels describe the subject, select the last option: *"No label applies."*

Date of entry: 11.05.2025	Signature of course coordinator Assoc. prof. PhD. *habil*. Călin Gabriel Tămaş	Signature of seminar coordinator Assoc. prof. PhD. *habil*. Călin Gabriel Tămaş

Date of approval in the department: 16.05.2025	Signature of the head of department .....