SYLLABUS

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 Molecular Biology and Biotechnology**
1.4 Field of study	**Biology**
1.5 Study cycle	**Master**
1.6 Study programme / Qualification	**Bioinformatics applied in life sciences**

2. Information regarding the discipline

2.1 Name of the discipline (en) (ro)			**Biodiversity and climate change assessment** **Evaluarea biodiversității și schimbărilor climatice**				
2.2 Course coordinator			**CS II dr. Turtureanu Pavel Dan**				
2.3 Seminar coordinator			**CS II dr. Turtureanu Pavel Dan**				
2.4. Year of study	**I**	2.5 Semester	**2**	2.6. Type of evaluation	**E**	2.7 Type of discipline	**Elective**
2.8 Code of the discipline	**BME1128**						

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/laboratory	**28**
Time allotment:					hours
Learning using manual, course support, bibliography, course notes					24
Additional documentation (in libraries, on electronic platforms, field documentation)					18
Preparation for seminars/labs, homework, papers, portfolios and essays					16
Tutorship					8
Evaluations					4
Other activities:					

3.7 Total individual study hours	70
3.8 Total hours per semester	126
3.9 Number of ECTS credits	5

4. Prerequisites (if necessary)

4.1. curriculum	• Database, statistics
4.2. competencies	• Programming skills

5. Conditions (if necessary)

5.1. for the course	• Videoprojector
5.2. for the seminar /lab activities	• Computers, specific development environment

6. Specific competencies acquired

Professional competencies	**C5.3** The ability to understand biodiversity concepts **C5.4** Biodiversity asessment using multiple measures and indices **C5.5** Climate change asessment using available datasets
Transversal competencies	**CT1.** Application of efficient work rules and responsible attitudes towards the scientific domain, for the creative exploitation of one's own potential according to the principles and rules of professional ethics **CT2.** Efficient conduct of activities organized in an interdisciplinary group and development of empathic capacity of interpersonal communication, networking and collaboration with diverse groups **CT3.** Use of efficient methods and techniques for learning, information, research and development of abilities for knowledge exploitation, for adapting to the needs of a dynamic society and for communication in a widely used foreign language.

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

7.1 General objective of the discipline	• To learn concepts and specific techniques used to assess biodiversity, as well as climate change and its consequences
7.2 Specific objective of the discipline	• Students will learn concepts and gather various skills of integrating, structuring, storing/managing information on biodiversity and climate data for further assessments (particularly using R)

8. Content

8.1 Course	Teaching methods	Remarks
1. Introduction	• Interactive exposure • Presentation • Explanation • Practical examples • Case-study discussions	
2. The concept of number of species		
3. The concept of beta-diversity		
4. Multivariate investigation of biotic communities		
5. Functional diversity		
6. Relationships between biodiversity and environmental factors		
7. Biodiversity monitoring		
8. Terrestrial biomes and major climates		
9. Historical climate changes		
10. Ongoing climate changes		
11. Methods and techniques for climate change assessment		
12. Climate change effects on alpine biodiversity		

13-14. Students' presentations		

Bibliography

1. Magurran, A.E. 2004. Measuring Biological Diversity. Blackwell Publishing, UK.
2. Anderson, M. J., Crist, T. O., Chase, J. M., Vellend, M., Inouye, B. D., Freestone, A. L., ... & Swenson, N. G. (2011). Navigating the multiple meanings of β diversity: a roadmap for the practicing ecologist. Ecology letters, 14(1), 19-28.
3. Turtureanu, P. D., Palpurina, S., Becker, T., Dolnik, C., Ruprecht, E., Sutcliffe, L. M., ... & Dengler, J. (2014). Scale-and taxon-dependent biodiversity patterns of dry grassland vegetation in Transylvania. Agriculture, Ecosystems & Environment, 182, 15-24.
4. Puşcaş, M., & Choler, P. (2012). A biogeographic delineation of the European Alpine System based on a cluster analysis of Carex curvula-dominated grasslands. Flora-Morphology, Distribution, Functional Ecology of Plants, 207(3), 168-178.
5. Puşcaş, M., Taberlet, P., & Choler, P. (2008). No positive correlation between species and genetic diversity in European alpine grasslands dominated by Carex curvula. Diversity and Distributions, 14(5), 852-861.
6. Pauli, H., Gottfried, M., Dullinger, S., Abdaladze, O., Akhalkatsi, M., Alonso, J. L. B., ... & Grabherr, G. (2012). Recent plant diversity changes on Europe's mountain summits. Science, 336(6079), 353-355.
7. Garnier, E., Navas, M-A., Grigulis, K. Plant Functional Diversity. Organism traits, community structure and ecosystem properties. Oxford, UK.

8.2 Seminar / laboratory	Teaching methods	Remarks
1. Sources of biodiversity data	• Interactive exposure • Explanation • Conversation • Didactical demonstration	
2. Numerical and statistical analysis of biodiversity in R		
3. Sources of climate data		
4-6. Working with climate and biodiversity data in R		
7. Students' project presentations		

Bibliography

8. Magurran, A.E. 2004. Measuring Biological Diversity. Blackwell Publishing, UK.
9. Anderson, M. J., Crist, T. O., Chase, J. M., Vellend, M., Inouye, B. D., Freestone, A. L., ... & Swenson, N. G. (2011). Navigating the multiple meanings of β diversity: a roadmap for the practicing ecologist. Ecology letters, 14(1), 19-28.
10. Turtureanu, P. D., Palpurina, S., Becker, T., Dolnik, C., Ruprecht, E., Sutcliffe, L. M., ... & Dengler, J. (2014). Scale-and taxon-dependent biodiversity patterns of dry grassland vegetation in Transylvania. Agriculture, Ecosystems & Environment, 182, 15-24.
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12. Puşcaş, M., Taberlet, P., & Choler, P. (2008). No positive correlation between species and genetic diversity in European alpine grasslands dominated by Carex curvula. Diversity and Distributions, 14(5), 852-861.
13. Pauli, H., Gottfried, M., Dullinger, S., Abdaladze, O., Akhalkatsi, M., Alonso, J. L. B., ... & Grabherr, G. (2012). Recent plant diversity changes on Europe's mountain summits. Science, 336(6079), 353-355.
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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 course is already included in the curriculum of many universities in the world.
- The content of this course is considered important by all research entities, as well as those focused on nature conservation and the management of natural resources

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Share in the grade (%)
10.4 Course	Know concepts and methods from the domain of biodiversity and climate	Test of theoretical knowledge	50%
10.5 Seminar/lab activities	Apply biodiversity analysis and climate in real problems	Project implementation and presentation	50%
10.6Minimum performance standards			
Each student must obtain at least 5 for the theoretical test and for the project presentation in order to receive the final grade. To obtain a grade of at least 5, the student must demonstrate mastery of the basic concepts of biodiversity and climate.			

Date	Signature of course coordinator	Signature of seminar coordinator
13.06.2024	**CS II dr. Pavel Dan Turtureanu**	**CS II dr. Pavel Dan Turtureanu**

Date of approval	Signature of the head of department
14.06.2024	**Assoc. Prof. Beatrice Kelemen**