COURSE DESCRIPTION

GIS IN ECOTOURISM RESOURCE MANAGEMENT

Academic year 2026/2027

1. Programme-related data

1.1. Higher Education Institution	Babeş–Bolyai University Cluj-Napoca
1.2. Faculty	Faculty of Geography
1.3. Department	Department of Geography of the Hungarian Line
1.4. Field	Geography
1.5. Level of study	MSc
1.6. Degree programme / Qualification	Ecotourism and sustainable development
1.7. Form of education	Full-time education

2. Course-related data

2.1. Course title	**GIS IN ECOTOURISM RESOURCE MANAGEMENT**			Course code	GMM6202
2.2. Course coordinator	dr. Magyari-Sáska Zsolt, lecturer				
2.3. Seminar coordinator	dr. Magyari-Sáska Zsolt, lecturer				
2.4. Year of study	I	2.5. Semester	2	2.6. Type of assessment	Exam
2.7. Course status	Compulsory			2.8. Course type	Specialisation subject

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

3.1. Number of hours per week	3	of which: 3.2. course	2	3.3. seminar/ laboratory/ project	1
3.4. Total of hours in the curriculum	42	of which: 3.5. course	28	3.6. seminar/ laboratory	14
Time allocation for individual study (IS) and self-taught activities (ST)					**hours**
Learning from textbooks, course materials, bibliography, and notes (IS)					20
Additional research in the library, on subject-specific electronic platforms, and on-site					20
Preparing seminars/ laboratories/ projects, assignments, reports, portfolios, and essays					30
Tutoring (professional guidance)					10
Examinations					3
Other activities					
3.7. Total hours of individual study (IS) and self-taught activities (ST)				**83**	
3.8. Total hours per semester				**125**	
3.9. Number of credits				**5**	

4. Prerequisites (where applicable)

4.1. curriculum-related	-
4.2 skills-related	-

5. Specific conditions (where applicable)

5.1. course-related	video projector, laptop
5.2. seminar/laboratory-related	computer network, internet, video projector

6.1. Competencies resulting from the completion of the degree programme *(as referred to in the curriculum)*

Professional competencies	
Competency code	**Competency**

PC2	Sector-specific knowledge in the field of Geography / Geography of Tourism (tourism planning and development, tourism mapping, green practices, tourism legislation): Know the geographic area and tourist destinations in detail; analyse data through flexible and pertinent use of evaluation criteria and methods relevant to: the particularities of a region, protection of local and traditional products, traditional Romanian village, and capitalization of cultural heritage; create thematic maps, including tourist and customized maps; design computer graphics for the production of visualization, cartographic and promotional materials and tools using a combination of GIS resources and GDS (Graphic Design Suites) digital graphics; provide technical expertise and specialized consultancy in different geographical, cultural-historical, socio-economic contexts; mediate and facilitate the understanding of tourism development related concepts; organize marketing and advertising activities for tourist destinations and events by using techniques for the development, management and valorisation of tourism products; develop collaborative and communication relations with various stakeholders involved in tourism and spatial planning; know the structure, functionality and operations specific to a destination management organization (DMO); manage administrative and economic bodies in tourism and related fields; teach Geography and Tourism courses.(ESCO 2632.5 Geographer/geography/geographical areas relevant to tourism/travel, tourism and leisure)
PC3	Key skills for the local and regional tourism industry, including the local tourism market: design and develop tourism products and services; design and operate tourist routes, trails, and itineraries; develop studies for community development through tourism; implement and assess tourism activities from the perspective of sustainability and green practices; develop strategies for community regeneration and resilience; elaborate and implement tourism development strategies, policies and models for tourism development. (ESCO 2632.5 Geographer/geography/geographical areas relevant to tourism/travel, tourism and leisure/tourist resources of a destination for further development and local area tourism industry).
PC5	Transdisciplinary knowledge: generate tourism activities using a transdisciplinary approach for harnessing natural and cultural heritage. (ESCO 2632.5 Geographer/geography/geographical areas relevant to tourism/travel, tourism and leisure/tourist resources of a destination for further development and local area tourism industry, and management and organization analyst and ESCO 1221.3.1 tourism development strategy manager).
Transversal competencies	
Competency code	**Competency**
TC2	S2 – Information skills - Collecting, storing, monitoring, and using information; Conducting studies, investigations, and tests; maintaining records; managing, evaluating, processing, analysing, and monitoring information and projecting outcomes (from ESCO S2.0-S2.9)
TC5	S5 – Working with computers - Using computers and other digital tools to browse, search, filter, organize, store, retrieve, and analyse data, to collaborate and communicate with others, to create and edit new content – licensed or open-source software products for editing (Office Suite), navigation, GIS (ArcGIS online, QGIS, etc.), digital graphics (CorelGDS, Inkscape, Canva, etc.) (from ESCO S5.0, S5.2, S5.5, S5.6, S6.7).

6.2. Learning outcomes relevant to the degree programme (as referred to in the curriculum)

Learning outcomes targeted by the subject		
Competency code	**Knowledge and comprehension**	**Specific academic skills**
PC2, PC3, TC1, TC2, TC5	4. The student/graduate analyzes and presents data and information in graphic and digital format.	4. The student/graduate applies digitized mapping using a combination of GIS resources and GDS digital graphics - to create visualization, cartographic and promotional materials and tools.
PC1, PC2, PC5, TC2, TC4, TC5	5. The student/graduate generates tourism activities through the transdisciplinary valorization of culture, natural and cultural heritage.	5. The student/graduate designs, organizes and carries out research and monitoring activities of the environment and communities for professional projects, studies, reports, consultancy.

7. Subject-specific learning outcomes

Knowledge and comprehension

Understanding the physical principles of remote sensing, the electromagnetic spectrum, and the behavior of radiation in the atmosphere.
Knowledge of digital processing methods and interpretation of satellite imagery for environmental and tourism applications.
Understanding multi-criteria evaluation (MCE) methods and multiple objective land allocation (MOLA) models.
Acquiring concepts of ecological modeling and suitability analysis for ecotourism resources.
Specific academic skills
Ability to identify and access remote sensing data sources appropriate for research purposes.
Ability to calculate and interpret normalized difference indices (such as NDVI) for environmental monitoring.
Ability to create and manage GIS databases specific to ecotourism resource management
Ability to conduct suitability analyses through practical case studies using advanced GIS operations.

8. Contents

8.1. Course	**Teaching and learning methods**	**Remarks**
Basic notions of remote sensing	Oral presentation with demonstration and interactive sections	4 hours
Supervised and unsupervised image classification	Oral presentation with demonstration and interactive sections	4 hours
Multiple criteria evaluation	Oral presentation with demonstration and interactive sections	3 hours
Ecological modelling	Oral presentation with demonstration and interactive sections	3 hours
Establishment of a GIS database	Oral presentation with demonstration and interactive sections	4 hours
Specific GIS operations for multiple criteria analysis	Oral presentation with demonstration and interactive sections	3 hours
Suitability analysis	Oral presentation with demonstration and interactive sections	4 hours
Multiple Objective Land Allocation	Oral presentation with demonstration and interactive sections	3 hours

Bibliography

1. Dean, M. (2022), A Practical Guide to Multi-Critera Analysis [PDF file]
2. Fung, T., Wong, F.K.K. (2007), Ecotourism planning using multiple criteria evaluation with GIS, Geocarto International, 22:2, pp.87-105 [PDF file]
3. Jorgensen, S.E. (2011), Handbook of Ecological Models Used in Ecosystem and Environmental Management, CRC Press [PDF file]
4. Leeuw, J.D., Ottichilo, W.K., Toxopenus, A.G., Prins, H.T. (2002), Application of remote sensing and geographic information systems in wildlife mapping and modelling. In Environmental Modeling with GIS and Remote Sensing, A. Skidmore (Ed.), pp. 121–144 (New York: Taylor & Francis).
5. Malczewski, J. (1999) GIS and Multicriteria Decision Analysis (New York: JohnWiley & Sons).
6. Martensson, U. (2011), Introduction to Remote Sensing and Geographical Information Systems, Lund University [PDF file]
7. ***, Fundamentals of Remote Sensing [PDF file]
8. *** (2009), Multi-criteria analysis: a manual, Department for Communities and Local Government: London [PDF file]

8.2. Seminar/ laboratory	Teaching and learning methods	Remarks
Supervised image classification – practical case study	Presentation, explanation, individual work	4 hours
Ecological modelling – practical case study	Presentation, explanation, individual work	3 hours
Suitability analysis – practical case study	Presentation, explanation, individual work	4 hours
Multiple criteria evaluation – practical case study	Presentation, explanation, individual work	3 hours

Bibliography

1. Carver, S.J. (1991), Integrating multi-criteria evaluation with geographical information systems. International Journal of Geographical Information Systems, 5, 321–339. https://doi.org/10.1080/02693799108927858
2. Dunnett, A., Shirsath, P.B., Aggarwal, P.K., Thornton, P., Joshi, P.K., Pal, B.D., Khatri-Chhetri, A., Ghosh J. (2018), Multi-objective land use allocation modelling for prioritizing climate-smart agricultural interventions, Ecological Modelling, Volume 381, https://doi.org/10.1016/j.ecolmodel.2018.04.008.
3. Fung, T., Wong, F.K.K. (2007), Ecotourism planning using multiple criteria evaluation with GIS, Geocarto International, 22:2, pp.87-105 [PDF file]
4. García G.A., Rosas E.P., García-Ferrer A., Barrios P.M. (2017) Multi-Objective Spatial Optimization: Sustainable Land Use Allocation at Sub-Regional Scale. Sustainability; 9(6):927. https://doi.org/10.3390/su9060927
5. Jiang, H., Eastman, J.R. (2000), Application of fuzzy measures in multi-criteria evaluation of GIS. International Journal of Geographical Information Science, 14, 173–184. https://doi.org/10.1080/136588100240903
6. Store, R., Kangas, J. (2001), Integrating spatial multi-criteria evaluation and expert knowledge for GIS based habitat suitability modelling. Landscape and Urban Planning, 55, 79–93. https://doi.org/10.1016/S0169-2046(01)00120-7
7. Ywumasi, Y.A. (2001), The use of GIS and remote sensing techniques as tools for managing nature reserves: the case of Kakum National Park in Ghana. Proceedings of IGARSS 2001, pp. 3227–3229 (Sydney: IEEE). https://doi.org/10.1109/IGARSS.2001.978311

9. Evaluation

Type of activity	9.1 Evaluation criteria	9.2 Evaluation methods	9.3 Percentage in the final grade
9.4. Course	Knowledge of the presented information, logic and clarity, knowledge of terminology	Written exam	50%
9.5. Seminar/ laboratory	Knowledge and correct practical application of the methods presented	Practical exam	50%
9.6 Minimum standard for passing			
Final grade of at least 5.			

10. SDG labels (Sustainable Development Goals)

	○ 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
○	○	○	○	○	●	○	○	○

Date of entry:
13.04.2026

Signature of course coordinator

Magyari S. Zsolt

Signature of seminar coordinator

Magyari S. Zsolt

Date of approval in the department:
28.04.2026

Signature of the head of department

Máthé Csongor