COURSE OUTLINE

1. Study programme information

Higher education institution	West University of Timisoara
1.2 Faculty	Chemistry, Biology, Geography
1.3 Department	Geography
1.4 Field of study	Geography
1.5 Level of study	Master's degree
1.6 Study programme / Qualification	Geographic Information Systems

2. Course information

2.1 Course title			GIS analysis of natural hazards and risk phenomena				
2.2 Course convenor/ Lecturer			PhD habil. Mircea VOICULESCU				
2.3 Teaching assistant			PhD habil. Mircea VOICULESCU				
2.4 Year of study	II	2.5 Semester	I	2.6 Type of assessment	Exam	2.7 Course type	DS/ DO

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

3.1 Number of hours per week	4	of which: 3.2 lecture	2	3.3 seminar/laboratory	2
3.4 Total hours in the curriculum	56	of which: 3.5 lecture	28	3.6 seminar/laboratory	28
Time distribution:					**ore**
Studying textbooks, course materials, bibliography and notes					34
Further research in libraries, on electronic platforms and in the field					24
Preparing seminars/ laboratories, homework, research papers, portfolios and essays					24
Tutoring					6
Examinations					6
Time distribution:					-

3.7 Total hours of individual study	**94**
3.8 Total hours per semester	**150**
3.9 Number of credits	**6**

4. Prerequisites (if applicable)

4.1 based on curriculum	fundamental
4.2 based on competencies	it's not necessary

5. Conditions (if applicable)

5.1 for the course	room with video projector and internet connection the course will be 50% face-to-face and 50% online.
5.2 for the seminar/laboratory	computer room, internet connection and GIS software online on e-learning and google meet platforms - 30%

6. Specific skills acquired

Professional skills	Spatial and temporal analysis of natural processes. Methods of graphic and cartographic representation of hazard and risk.
Transversal skills	Applying efficient and responsible work strategies, based on the principles, norms and values of the code of professional ethics. Applying efficient work techniques in a multidisciplinary team, ethical attitude towards the group, respect for diversity and multiculturalism, acceptance of diversity of opinion.

7. Course objectives (as resulting from the accumulated specific competencies)

7.1. General objective	Understanding the importance of the course as a technique and method of investigation and analysis in all geographical sciences
7.2. Specific objectives	Acquiring the notions of processes and natural phenomena. Understanding the notion of risk. Understanding the need for graphical and cartographic representation of natural phenomena and processes with potential risk.

8. Content

8.1. Course	**Metode de predare**	**Observaţii**
Natural processes and phenomena: concept, definition, hazard and risk.	Introductory scientific lecture	
Representation of hazard and risk. Methods of representation.	Introductory scientific lecture	
Geomorphic processes: graphic and cartographic representation, spatial analysis.	Scientific lecture, dialogue, explanation.	
Climate processes: representation of hazard and risk.	Scientific lecture, dialogue, explanation.	
Hydrological processes - representation of hazard and risk.	Scientific lecture, dialogue, explanation.	
Biohazard - spatial analysis		
Analysis and evaluation of environmental components: monitoring systems, spatial levels and stages of monitoring, integrated computer system for environmental monitoring.	Scientific lecture, dialogue, explanation.	

References

Birkmann, J., Kienberger, S., Alexander, D. 2014. Assessment of Vulnerability to Natural Hazards: A European Perspective, Elsevier, 240 pp.

Carrara, A., Guzzetti, F. 2013. Geographical Information Systems in Assessing Natural Hazards, Springer Science & Business Media, 356 pp.

Donald, Z., James, J., Stanley, B. 1983. Technological hazards, Resource Publications in Geography, State College, Pennsylvania.

Irimuş, A.I., Vescan, I., Man, T. 2005. Mapping techniques, monitoring and GIS analysis, Casa Cărţii de Ştiinţă, Cluj-Napoca.

Gares, A.,P., Douglas, J.S., Nordstrom, F.K. 1994. Geomorphology and natural hazards, Geomorphology, 10.

Hamed, A., Kasturi D. Solaimani, K. 2011. GIS-based probability assessment of fire risk in grassland and forested landscapes of Golestan Province, Iran, International Conference on Environmental and Computer Science, vol. 19, Singapore.

Moe, L.T., Pathranarakul, P. 2006. An integrated approach to natural disaster management, *Disaster Prevention and Management*, 15, 3, 396-413. https://doi.org/10.1108/09653560610669882

Peckham, J.R., Jordan, G. 2005. Digital Terrain Modelling: Development and Applications in a Policy Support Environment, Springer.

Shekhar, S., Hui Xiong, H. 2008. Encyclopedia of GIS, Springer.

8.2. Seminar/laborator	**Metode de predare**	**Observaţii**
Slope processes. Hazard and risk mapping. Spatial representation of perception.	Scientific explanation, case studies.	
Climatic processes. Hazard and risk mapping. Spatial representation of perception.	Scientific explanation, case studies.	
Floods. Flood risk maps. Spatial representation of perception.	Scientific explanation, case studies.	
References		

Adam, I. 2007. Method of fire risk assessing in the forests of Romania, Analele ICAS 50:261-267.
Carrara, A., Guzzetti, F., Cardinali, M., Reichenbach, P. 1999. Use of GIS Technology in the Prediction and Monitoring of Landslide Hazard, *Natural Hazards*, 20: 117-135. https://doi.org/10.1023/A:1008097111310
Conforti, M., Aucelli, P.C., Robustelli, G., Scarciglia, F. 2011. Geomorphology and GIS analysis for mapping gully erosion susceptibility in the Turbolo stream catchment (Northern Calabria, Italy), *Nat Hazards*, 56:881-898. doi: 10.1007/s11069-010-9598-2
Dominey-Howes, D., Minos-Minopoulos, D. 2004. Perceptions of hazard and risk on Santorini. Journal of Volcanology and Geothermal Research 137, 285–310. doi:10.1016/j.jvolgeores.2004.06.002
Fernández, T., Irigaray, C., EL Hamdouni, R., Chacón, J. 2003. Methodology for Landslide Susceptibility Mapping by Means of a GIS. Application to the Contraviesa Area (Granada, Spain), *Natural Hazards*, 30: 297-308. doi: 10.1023/B:NHAZ.0000007092.51910.3f
Grecu, F. 2008. Geological and geomorphological hazard and risks, București.
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Ho, M-C., Shaw, D., Lin, S., Chiu, Y-C. 2008. How Do Disaster Characteristics Influence Risk Perception? Risk Analysis, Vol. 28, No. 3, 635-643. DOI: 10.1111/j.1539-6924.2008.01040.x
Kamp, U., Growley, J.B., Khattak, A.G., Owen, A.L. 2008. GIS-based landslide susceptibility mapping for the 2005 Kashmir earthquake region, *Geomorphology*, 101, 631-642. doi:10.1016/j.geomorph.2008.03.003
Peckham, J.R., Jordan, G. 2005. Digital Terrain Modelling: Development and Applications in a Policy Support Environment, Springer.
Pradhan, B., Suliman, M.D, Awang, M.A., 2007. Forest fire susceptibility and risk mapping using remote sensing and geographical information systems (GIS), *Disaster Prevention and Management*, 16(3):344-352. doi: 10.1108/09653560710758297
Shekhar, S., Hui Xiong, H. 2008. Encyclopedia of GIS, Springer.
Zahiri, H., Palamara, D.R., Flentje, P., Brassington, G.M., Baafi, E. 2006. A GIS-based Weights-of-Evidence model for mapping cliff instabilities associated with mine subsidence, *Environmental Geology*, 51, 3, 377-386. https://doi.org/10.1007/s00254-006-0333-y

9. Corroborating course content with the expectations held by the representatives of the epistemic community, professional associations and typical employers in the field of the study programme

The course can stimulate the personal involvement of students in the identification and spatial and temporal assessment of some processes and natural phenomena with potential risk.
The course facilitates the initiation of contacts and collaborations with specialized institutions in the field of natural hazards and risks.

10. Assessment

Type of activity	10.1 Assessment criteria	10.2 Assessment methods	10.3 Weight in the final mark
10.4 Course	written exam	written verification	40%
		current observation	10%
10.5 Laboratory	oral exam	assessment of report	25%
		assessment of practical activities	25%
10.6 Minimum performance standard			
grade 5 as a mean of evaluation from the above mentioned compulsory activities			

Date
07.09.2023

Course convenor's signature

PhD habil. Mircea VOICULESCU

Date of approval in the department

Head of department's signature