COURSE OUTLINE

1. **Study programme information**

1.1 Higher education institution	Universitatea de Vest din Timişoara
1.2 Faculty / Department	Chimie-Biologie-Geografie/Geografie
1.3 Sub-department	-
1.4 Field of study	Geography
1.5 Level of study	Master's degree
1.6 Study programme / Qualification	Geographic Information Systems

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2. **Course information**

2.1 Course title	Geovisualization						
2.2 Course convenor/ Lecturer	Dr. Mircea Ardelean						
2.3 Teaching assistant	Dr. Mircea Ardelean						
2.4 Year of study	I	2.5 Semester	I	2.6 Type of assessment	E	2.7 Course type	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:					**hours**
Studying textbooks, course materials, bibliography and notes					28
Further research in libraries, on electronic platforms and in the field					20
Preparing seminars/ laboratories, homework, research papers, portfolios and essays					30
Tutoring					8
Examinations					8
Other activities ……………………………………					

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	●
4.2 based on competencies	●

5. **Conditions (if applicable)**

5.1 for the course	computer, whiteboard, video-projector, specific software
5.2 for the seminar/laboratory	computers, whiteboard, video-projector, specific software

6. Accumulated specific competencies

Professional competencies	• Knowledge of concepts in geovisualization • Understanding the differences between statistics and spatial statistics • Theoretical knowledge and techniques on exploratory data analysis (EDA) • Theoretical knowledge and techniques on exploratory spatial data analysis (ESDA) • Understanding the role of *time* in spatial data analysis • Operational skills in ArcGIS, GeoDA
Transversal Competencies	• Understanding of ethics in academic conduct (correct citations, avoiding plagiarism, avoiding fabrication) • Developing team working abilities.

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

7.1 General objective	Students are able to professionally perform an exploratory spatial data analysis in order express a substantial research hypothesis.
7.2 Specific objectives	

8. Content

8.1 Lecture	**Teaching methods**	**Observations**
1. Geovisualization: general framework (what, why & how?) 2. Symbolization, typography, visual hierarchy 3. Use of color. Cartograms 4. Data classification 5. Mapping time 6. Interpolation methods and their visualization 7. Augmented & enhanced reality 8. 3D representation of relief 9. Exploratory Data Analysis – statistical maps 10. Exploratory Spatial Data Analysis – spatial error	Lectures combined interactively with hands-on exercises.	

Bibliography
  1. **Anselin L.** 2003 *GeoDA 0.9 User's guide*
  2. **Anselin L.** 2005 *Exploring Spatal Data with GeoDA*
  3. **Dykes J., MacEarchen A.M., Kraak M-J** 2005 *Exploring geovisualization*, Elsevier
  4. **Kraak, M.J.**, 2003, Geovisualization illustrated, *J. of Photogrammetry & Remote Sensing*, **57**,
  5. 390-399
  6. **Longley, P.A., Goodchild, M.F., Maguire, D.J., Rhind, D.W.**, 2005, *Geographical Information*
  7. *Systems and Science*, John Wiley & Sons, Chichester, England
  8. **Monmonier M.** 1996 *How to Lie with Maps*, The University of Chicago Press
  9. **Slokum T.A., Mc.Master R.B., Kessler F.C., Howard H.H.** 2009 *Thematic cartography and Geographic Visualization*, Prentice Hall		

8.2 Seminar / laboratory	**Teaching methods**	**Observations**
1. The importance of colour in map making 2. Time animation 3. Visualization of results from interpolation	Hands-on exercises.	

4. 3d visualisation on Google Earth 5. How many variables to put on the map? – the challenge of multiple variables map 6. How not to lie with maps? - elementary statistics for spatial data representation 7. Project – variables, classification 8. Final project	

Bibliography
Literature will be selected individually, according to research interests of the students.

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**

This course will offer the theoretical framework and specific hands-on abilities for large spatial data-sets manipulation and assessment. Geovisualization techniques are necessary skills to start-up scientific projects, MSc Theses and/or PhD programs.

10. **Assessment**

Type of activity	10.1 Assessment criteria	10.2 Assessment methods	10.3 Weight in the final Mark
10.4 Lecture	Interactivity using e-learning.uvt and GoogleMeet		20 %
10.5 Seminar / laboratory	The degree to which students are able to conduct an exploratory spatial data analysis.		80 %
10.6 Minimum performance standard			
• Obtaining minimum 5 for each practical project			

Date   Course convenor's signature

13.09.2024

Date of approval in the department   Head of department's signature