

## COURSE OUTLINE

### 1. Study programme information

1.1 Higher education institution	Universitatea de Vest din Timișoara
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
<b>Time distribution:</b>					<b>hours</b>
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 .....					
<b>3.7 Total hours of individual study</b>	<b>94</b>				
<b>3.8 Total hours per semester</b>	<b>150</b>				
<b>3.9 Number of credits</b>	<b>6</b>				

### 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	<ul style="list-style-type: none"> <li>Knowledge of concepts in geovisualization</li> <li>Understanding the differences between statistics and spatial statistics</li> <li>Theoretical knowledge and techniques on exploratory data analysis (EDA)</li> <li>Theoretical knowledge and techniques on exploratory spatial data analysis (ESDA)</li> <li>Understanding the role of <i>time</i> in spatial data analysis</li> <li>Operational skills in ArcGIS, GeoDA</li> </ul>
Transversal Competencies	<ul style="list-style-type: none"> <li>Understanding of ethics in academic conduct (correct citations, avoiding plagiarism, avoiding fabrication)</li> <li>Developing team working abilities.</li> </ul>

## 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.	
<b>Bibliography</b> <ol style="list-style-type: none"> <li>1. Anselin L. 2003 <i>GeoDA 0.9 User's guide</i></li> <li>2. Anselin L. 2005 <i>Exploring Spatal Data with GeoDA</i></li> <li>3. Dykes J., MacEarchen A.M., Kraak M-J 2005 <i>Exploring geovisualization</i>, Elsevier</li> <li>4. Kraak, M.J., 2003, Geovisualization illustrated, <i>J. of Photogrammetry &amp; Remote Sensing</i>, <b>57</b>,</li> <li>5. 390-399</li> <li>6. Longley, P.A., Goodchild, M.F., Maguire, D.J., Rhind, D.W., 2005, <i>Geographical Information Systems and Science</i>, John Wiley &amp; Sons, Chichester, England</li> <li>7. Monmonier M. 1996 <i>How to Lie with Maps</i>, The University of Chicago Press</li> <li>9. Slokum T.A., Mc.Master R.B., Kessler F.C., Howard H.H. 2009 <i>Thematic cartography and Geographic Visualization</i>, Prentice Hall</li> </ol>		
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		
<b>Bibliography</b> 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			
<ul style="list-style-type: none"> <li>Obtaining minimum 5 for each practical project</li> </ul>			

Date

Course convenor's signature

Teaching assistant's signature

13.09.2023

Date of approval in the department

Head of department's signature