COURSE GUIDE

EC1.07
SPATIAL DATA ANALYSIS IN R

Taras Shevchenko National University of Kyiv

Faculty of Sociology

COURSE INFO	
Title	Spatial Data Analysis in R
Code	EC1.07
Field of study	054 Sociology
Degree level	master
Study program	Sociology (language of instruction - English)
Type	elective
Semester	3
ECTS credits	5.00
Language of instruction	English
Final control	exam
Instructor	Dr. Taras Tsymbal

SUMMARY

All social life unfolds in a geographical space, which can act as a factor, facilitator, or barrier to the development of social processes and the emergence of social phenomena. The course "Analysis of spatial data in R" is aimed at acquiring a set of skills that allow for a full cycle of research work with geospatial data - from their extraction to statistical inference. Students will learn how to use OpenStreetMap and GoogleMaps to create and retrieve geospatial data, display statistics on maps and heat maps, and measure relationships between variables adjusted for geographic effects.

PREVIOUS KNOWLEDGE

1. Ability to use R and RStudio at a basic level: work with tables and csv-files
2. Proficiency in English at level B1 or higher
3. Successful completion of Quantitative Social Data Analysis (CC06)

COMPETENCES	
GC04	Ability to work in an international context
SC04	Ability to collect and analyze empirical data using contemporary methods of sociological research
SC05	Ability to discuss findings of sociological research and projects in Ukrainian and foreign languages
SC12	Ability to apply contemporary methods of data processing in sociological research and use software packages for data processing and visualization of findings

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COURSE LEARNING OUTCOMES	
1.1	Know the types and structure of geospatial data
2.1	Be able to create, store, import and export geospatial data in R
3.1	Use cartographic visualization to present research findings
4.1	Reasonably apply methods and techniques of spatial analysis in the study of social phenomena and processes

EVALUATION		
20 points	Four practical assignments at seminars	
40 points	Four home projects	
40 points	Final exam (multiple-choice test and a practical assignment) Admission to exam threshold: 36 points	
Grade explication	90-100	Excellent
	75-89	Good
	60-74	Satisfactory
	0-59	Fail

COURSE STRUCTURE

CHAPTERS	WORKLOAD (in hours)		
	lectures	seminars	self-study
1. Geospatial data, their creation, export and import in R	4	10	40
2. Creation of static, dynamic and interactive maps in R	2	8	26
3. Exploratory analysis of spatial data	4	6	20
4. Spatial autocorrelation and spatially weighted regression	4	6	20

READINGS

Required

1. Bivand S. Roger, Pebesma Edzer, Gomez-Rubio Virgilio. Applied Spatial Data Analysis with R. – New York: Springer, 2013. – 405 pages. Retrieved at: http://gis.humboldt.edu/OLM/r/Spatial%20Analysis%20With%20R.pdf
2. Chi Guangqing, Zhu Jun, Spatial Regression Models for the Social Sciences, 2019. – 272 pages.
3. Dorman Michael. Introduction to Spatial Data Programming with R, 2020. Retrieved at: http://132.72.155.230:3838/r/

4. Lansley Guy, Cheshire James. An Introduction to Spatial Data Analysis and Visualization in R, 2016. Retrieved at: http://www.spatialanalysisonline.com/An%20Introduction%20to%20Spatial%20Data%20Analysis%20in%20R.pdf
5. Lovelace Robin, Nowosad Jakub, Muenchow Jannes, Geocomputation with R. – Chapman and Hall/CRC, 2019. – 353 pages. Retrieved at: https://geocompr.robinlovelace.net/

Additional

1. Anselin Luc, Rey Sergio J. (eds), Perspectives on Spatial Data Analysis, Springer, 2010. – 308 pages.
2. Logan John R. Making a Place for Space: Spatial Thinking in Social Science // Annual Review of Sociology. – 2012. – Vol. 38. – Pp. 507–524.
3. Perspectives on Spatial Data Analysis (ed. by Anselin, Luc, Rey, Sergio J.). – Berlin: Springer, 2010. – 290 pages.
4. Xu Yanqing, Kennedy Eugene, An Introduction to Spatial Analysis in Social Science Research // The Quantitative Methods for Psychology. – 2015. – Vol. 11. – No. 1. – Pp. 22–31.

Other sources

1. http://moodle.soc.univ.kiev.ua/ (contains all required texts, discussion forum, home assignments, control tests, links to online meetings and links to class recordings)
2. https://www.r-bloggers.com/
3. http://rspatial.org/index.html
4. https://learn.datacamp.com/
5. https://cvk.gov.ua/
6. OpenStreetMap: https://www.openstreetmap.org/
7. GoogleMaps: https://www.google.com/maps