Taras Shevchenko National University of Kyiv

COURSE GUIDE

EC2.06
QUANTITATIVE ANALYSIS OF TIME-SERIES DATA

Faculty of Sociology

COURSE INFO	
Title	Quantitative Analysis of Time-Series Data
Code	EC2.06
Field of study	054 Sociology
Degree level	Master
Study program	Sociology (language of instruction - English)
Type	elective
Semester	4
ECTS credits	5.00
Language of instruction	English
Final control	exam
Instructor	Dr. Taras Tsymbal

SUMMARY

Time-series, or longitudinal, data are arranged in terms of time information about objects (individuals, social groups, territorial units, or organizations). Due to the increasing possibilities for data collection by means of contemporary information technologies, such data are becoming more and more accessible to researchers. However, the methods of handling and analysis of time series differ from the traditional datasets with which sociologists work due to their specificity, in particular deviations from the presumption of independence of observations and measurability of the steps between observations. The course "Quantitative analysis of time-series data" is intended to master the methods of creating, processing, and analyzing such data in the R environment, as well as constructing models and forecasting processes.

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 types and structure of time-series data
2.1	Be able to create, save, import and export time-series data in R
3.1	Use computer visualization to present research findings
4.1	Reasonably apply methods and techniques of time-series 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 two practical assignments) 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. Time-series data, their creation, export and import in R	4	8	40
2. Construction of static, dynamic and interactive visualizations of time-series data in R	2	4	26
3. Autocorrelation in time series	4	4	25
4. Forecasting with time series	4	4	25

READINGS

Required

1. Box-Steffensmeier Janet M., Freeman John R., Hitt Matthew P., Pevehouse Jon C. W. Time Series Analysis for the Social Sciences, Cambridge University Press, 2014. – 298 pages
2. Cryer Jonathan D., Kung-Sik Chan, Time Series Analysis With Applications in R. – New York: Springer, 2010. – 491 pages.

3. Shumway Robert H., Stoffer David S. Time Series Analysis and Its Applications With R Examples. – New York: Springer, 2011. – 596 pages.
4. Yaffee Robert Alan. An Introduction to Time Series Analysis and Forecasting: With Applications of SAS and SPSS. – San Diego: Academic Press, 2000. – 528 pages.

Additional

1. Grolemund Garrett. Hand-On Programming with R. – Sebastopol: O'Reilly, 2014. – 230 pages.
2. Grolemund Garrett, Wickham Hadley. R for Data Science. – Sebastopol: O'Reilly Media, 2017. – 522 pages.

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. https://learn.datacamp.com/