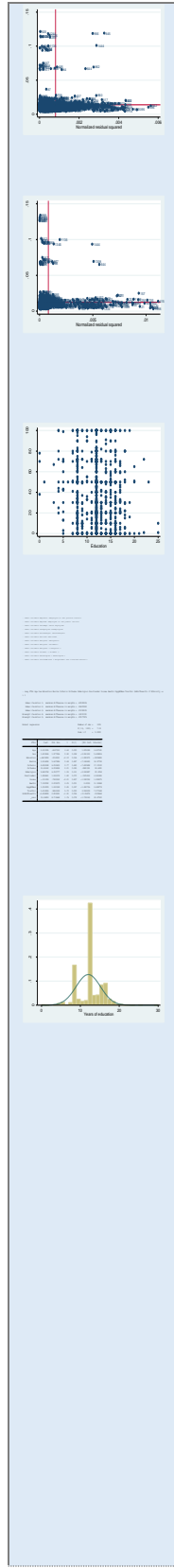


Course	<b>R CODING FOR PUBLIC POLICY DECISIONS MSc in Public Policy and Management</b>			
	Type	Semester	ECTS	Code
	ELECTIVE	III	4	
Course				
Course objectives and learning outcomes	<p>R is one of the major languages for data science, and widely applied in decision science. Similar to many other social science subdisciplines, decision science relies on data. If we want to bring meaning in the word “science” on the name of the decision science subdiscipline, then collecting and analysing data should be our main activities and their study should be an important component of our program.</p> <p>Today, studying decision science is experiencing intensive and extensive computerization. The dramatic increase of available data has brought about the need to master computer programs and programming languages that would perform calculations of the large amount of data that we possess. Those skills are a must not only in the academic research activity, but also in a professional life as public servants or public policy drafters and implementers. Most of the quality job calls today in our country and around the world ask for candidates with knowledge in statistical packages and programming languages.</p> <p>This course aims at introducing master students in the world of statistical analysis with the programming language R. Its objective is that at the end of the course, students could confidentially write in their CV-s a decent knowledge of the R programming language.</p> <p>This course aims at strengthening the skills component of our program. Moreover, this course represents one more component of our orientation toward research-oriented teaching, which would allow students more independence in the data manipulation and analysing process. Another outcome of this course is the strengthening of students’ knowledge acquired in another important course of this program, Advanced Quantitative Research Methods.</p> <p>Although this course is rooted in statistics, our examples will come from social and behavioural sciences, especially Political Science. We will use data that other researchers have gathered as well as our own data that we have collected over the years through practicums with collecting data through public opinion surveys.</p>			
Learning outcomes	<ol style="list-style-type: none"> <li>1. The capability to practically apply knowledge acquired in the Advanced Quantitative Research Methods course in the same program;</li> <li>2. Mastering the most important and practical elements of the R programming language;</li> <li>3. Acquiring the essentials of programming for data science;</li> <li>4. Student preparation to write publishable master thesis by using big data and statistical analysis.</li> </ol>			
Content	<b>Weekly program</b>			<b>Week</b>
	<ol style="list-style-type: none"> <li>1. INTRODUCTION TO R AND ITS SOURCES The R editor environment and R Studio; the R packages; the RData format; R auxiliary documents, the Rblog, <i>The R Journal</i></li> </ol>			1



2. MENAGING DATA ON R	2
Command examples; creating a new dataset; sub-dataset specification – the <code>in</code> and <code>if</code> qualifiers; creating and replacing variables; using functions; converting between numeric and string variables; creating new categorical and ordered variables.	
3. GRAPHS ON R	3
Command examples; histograms; scatterplots; line plots; connected line plots; other twoway plot types; box plots; pie charts; bar charts; dot plots; symmetry and quantile plots; quality control graphs; adding text to graphs; overlaying multiple twoway plots; retrieving and combining graphs.	
4. ANOVA AND OTHER COMPARISON METHODS ON R	4
Command examples; one-sample test; two-sample tests; one-way analysis (ANOVA); two- and N-way analysis of variance; analysis of covariance (ANCOVA); predicted values and error-bar charts	
5. LINEAR REGRESSION WITH R	5
Command examples; the regression table; multiple regression; predicted values and residuals; basic graphs for regression; correlations; hypothesis tests; dummy variables; automatic categorical variable indicators and interactions; stepwise regression; polynomial regression; panel data.	
6. REGRESSION DIAGNOSTICS WITH R	6
Command examples; SAT score regression, revisited; diagnostic plots; diagnostic case statistics; multicollinearity.	
7. FITING CURVES AND ROBUST REGRESSION WITH R	7
Command examples; band regression; lowess smoothing; regression with transformed variables; conditional effect plots; nonlinear regression; regression with ideal data; Y outliers; X outliers; asymmetric error distribution; robust analysis of variance; robust estimates of variance.	
8. LOGISTIC REGRESSION WITH R	8
Command examples; space shuttle data; using logistic regression; conditional effect plots; diagnostic statistics and plots; logistic regression with ordered-category y; multinomial logistic regression.	
9. TIME SERIES ANALYSIS WITH R	9
Command examples; smoothing; further time plot examples; lags, leads, and differences; correlograms; ARIMA models.	
10. DATA IMPUTATION ON R	10
Command examples; basic concepts and tools; data imputation for values missing at random (MAR) and missing completely at random (MCAR); example program; Monte Carlo simulation	
11. WRITING YOUR THESIS ON R	11
Command examples; the Rmarkdown package and its applications	

	12. INTRODUCTION TO PROGRAMMING WITH THE R LANGUAGE Basic concepts and tools; example program: moving autocorrelation; help file; matrix algebra; bootstrapping; Monte Carlo simulation	12
<b>Teaching methods</b>	<b>Academic activity</b>	<b>Weight (%)</b>
	1. Lectures and seminars	45%
	2. Lab work	45%
	3. Practicum (optional and outside the academic timeline)	10%
<b>Academic obligations</b>	<b>Academic obligations</b>	<b>Number</b>
	1. Homework and/or classwork	10
<b>Sources and concretisation tools</b>	<b>Tools</b>	<b>Week</b>
	1. Classroom (e.g)	2, 3, 4, 5, 6, 7, 8, 9, 10, 11
	2. Computer lab (e.g)	90%
	3. Moodle	
	4. Software Stata, R	
	5. Projector	
<b>Activity and load</b>	<b>Activity type</b>	<b>Weekly hrs</b>
	1. Lectures and seminars	2
	2. Lab work	24
	3. Independent learning	30
	4. Homework and classwork	41
<b>Literature/ references</b>	1. Ridvan Peshkopia. 2018. Statistika Kompjuterike me STATA: Përmbledhje Ligjëratash. Prishtinë: UBT.	
	2. Eralda Dhamo. 2018. Hyrje në R: Përmbledhje leksionesh.	
<b>Contact</b>		