

## SYLLABUS for Data Analysis for Management and Economics

Basic data for the course			
<b>Academic unit:</b>	Faculty of Economics		
<b>Title of the course:</b>	<b>Data Analysis for Management and Economics</b>		
<b>Level:</b>	Bachelor		
<b>Status of the course:</b>	Elective		
<b>Year of studies:</b>	3rd year – Sixth semester		
<b>Number of hours per week:</b>	2 + 1		
<b>ECTS credits:</b>	4		
<b>Time/location:</b>	Faculty of Economics, University of Prishtina “Hasan Prishtina”		
<b>Tutor:</b>	Prof. Ass. Ardiana Gashi		
<b>Tutor’s contact details:</b>	ardianag@gmail.com		
Content of the course			
	This course provides students with quantitative tools that serve as the analytical foundation for subsequent courses in the program, including sharpening computer spreadsheet skills. The use of data analysis to support managerial decisions will be emphasized. Topics covered include descriptive statistics, probability models, decision theory, applied statistical analysis, and deterministic forecasting models.		
Course’s objectives:			
	Students will learn about data exploration and visualization, methods for data & decision modelling, and risk analysis; The course is very hands-on, and emphasis is placed on understanding when to use which method; This course will allow a better interaction with personnel specializing in analytics; In addition, it will teach how to implement data-driven decision making using powerful Excel-based desktop software.		
The expected outcomes:			
	Upon completion of the course students will be able to: Identify an underlying analytical structure in a seemingly complex and amorphous decision problem; Understand the trade-offs involved in the decision; Understand the role of uncertainty and risk in the decision-making process; Analyze available data to understand relationships among variables and to create predictions; Use available computing technology (e.g., spreadsheets) to arrive at optimal solutions.		
The students’ workload ( <i>hours per semester, ECTS</i> )			
Activity	Activity	Activity	Total

Lectures	2*15 weeks		30
Seminars (theoretical and practical) Exercises	1*15 weeks		15
Case studies			
Direct contact with tutor	1		5
Field research	5		5
Colloquiums	2		6
Homework	1*10 weeks		10
Individual study (at library or at home)			20
Final preparation for the exam	2		2
Evaluation	2		2
Projects, presentation etc.	5		5
<b>Total</b>			<b>100</b>
<b>Teaching methods:</b>	Lectures, discussions and in-class projects.		
<b>Assessment methods:</b>	Attendance/In-class Assignments 10%; Homework / Problem Sets 20%; Research Paper and Oral Presentation 30%; Tests (20% each) 40%.		
<b>Literature</b>			
<b>Basic literature:</b>	<p>1. Bertsimas, Dimitris, and Robert Freund. Data, Models, and Decisions: The Fundamentals of Management Science. Charlestown, MA: Dynamic Ideas, 2004. ISBN: 9780975914601.</p> <p>2.S. Christian Albright, Wayne Winston, Christopher Zappe, Data Analysis and Decision Making (2010), ISBN-13: 978-0538476126 ISBN-10: 0538476125 Edition: 4th</p>		
<b>Additional literature:</b>	<p>Statistics for Management and Economics (with Online Content Printed Access Card) [Hardcover], Gerald Keller, Publication Date: January 1, 2011; ISBN-10: 0538477490; ISBN-13: 978-0538477499; Edition: 9</p>		

<b>The detailed plan of work:</b>	
<b>Week</b>	<b>Topic</b>
<i>Wee 1</i>	Compiling databases for decision making purposes: times series, cross section, panel and pooled data. Types of variables and variable derivations
<i>Wee 2</i>	Obtaining an interpreting descriptive statistics
<i>Wee 3</i>	Data description using graphs, tables, cross tabulations
<i>Wee 4</i>	Populations versus samples: sampling, inference; experimental design
<i>Wee 5</i>	Normal distribution and application in decision making
<i>Wee 6</i>	Sampling distributions, counts and proportions, point and

	interval estimation: applications in decision making
<i>Wee 7</i>	Hypothesis testing: power and inference for single and two populations
<i>Wee 8</i>	Probability approaches: Bayesian Theory, Decision making tree
<i>Wee 9</i>	Analysis of variance (ANOVA)
<i>Wee 10</i>	Linear regression, correlation analysis, causation and data transformations
<i>Wee 11</i>	Multiple regression analyses
<i>Wee 12</i>	Time series analyses: forecasting
<i>Wee 13</i>	Time series analyses: forecasting
<i>Wee 14</i>	Decision analysis: uncertainty versus risk, utility theory, game theory
<i>Wee 15</i>	Wrap up and preparations for the final exam

<b>Academic policies and code of conduct:</b>
---

- |  |
|--|
| <ul style="list-style-type: none"> <li>- Active participation in lectures and exercises</li> <li>- Active contribution in group work</li> <li>- Apply best practices in seminar preparations (properly referencing and citing the work of others)</li> </ul> |
|--|

**data, graphs, determinism vs. stochasticity, populations vs. samples, experimental design, sampling, inference, bivariate data; scatterplots, least squares regression and correlation Ch 3 data reduction, descriptive statistics, "normal" distribution Ch 4 randomness, probability concepts, random variables (r.v.'s), distribution moments (mean, variance, etc.); discrete models Ch 5 continuous probability models Ch 6,7 sampling distributions, counts and proportions, point and interval estimation: confidence, significance, statistical tests Ch 8,9 Introduction to hypothesis testing; power and inference, inference for single and two populations Ch 9,10 Hypothesis testing and inference for two populations, and for population variance Ch 12 Good-of-fit tests, contingency analysis, and general categorical data analysis**

**Other Topics Ch 11 Introduction to Analysis of variance (ANOVA), two-factor analysis; Linear regression, correlation analysis, causation, and data transformations Ch 13b Statistical inference for regression parameter estimates Ch 14 multivariate (multiple) regression and ANOVA Ch 15 time series analysis and forecasting Ch 16 non-parametric statistics Ch 17 Quality control, statistical process control (SPC) Ch 18 decision analysis - uncertainty vs. risk, utility theory, game theory**