

MODULE OUTLINE ERM512

1. GENERAL INFORMATION

SCHOOL	FACULTY OF ECONOMICS AND MANAGEMENT, OPEN UNIVERSITY CYPRUS (OUC) & SCHOOL OF SOCIAL SCIENCES, HELLENIC OPEN UNIVERSITY (HOU)		
PROGRAM COURSE	ENTERPRISE RISK MANAGEMENT (ERM)		
LEVEL OF STUDY	POSTGRADUATE		
MODULE CODE	ERM512	SEMESTER OF STUDY	1 st
MODULE TITLE	ADVANCED QUANTITATIVE METHODS FOR RISK MANAGEMENT		
INDEPENDENT TEACHING ACTIVITIES <i>in case credits are awarded for separate components/parts of the course, e.g. in lectures, laboratory exercises, etc. If credits are awarded for the entire course, give the weekly teaching hours and the total credits</i>		HOURS	CREDIS
Weekly teaching hours 19-23 hours x 13 weeks		250-300	10 ECTS
COURSE TYPE Compulsory, Optional, Optional mandatory	COMPULSORY		
PREREQUISITE MODULES:	None		
LANGUAGE OF INSTRUCTION AND EXAMS	English		
THE MODULE IS OFFERED TO ERASMUS STUDENTS	Yes		
MODULE WEBSITE (URL)	https://www.ouc.ac.cy/index.php/el/studies/programmes/master/master-erm-2/thematikes-enotites-erm/3565-erm512 Each module has its own space in the Learning Management System of OUC (https://eclass.ouc.ac.cy/), with controlled access (use of code) for students and teaching staff.		

2. LEARNING OUTCOMES

<p>Learning Outcomes</p> <p><i>The course learning outcomes, specific knowledge, skills and competences of an appropriate (certain) level, which students will acquire upon successful completion of the course, are described in detail. It is necessary to consult:</i></p>
<p>Upon completion of this module, the students will be able to:</p> <p><u>Knowledge</u></p> <ul style="list-style-type: none"> - Exhibit a deep and thorough understanding of statistical concepts underlying sampling and sample statistics, the applications of inferential statistics and the processes of hypothesis testing, and the underlying mechanisms of regression including the assumptions and the estimation process. <p><u>Comprehension</u></p> <ul style="list-style-type: none"> - Distinguish among various statistical measures and modelling techniques and classify them with respect to their suitability in analysing empirical data and meeting the objectives of the study. - Explain the underpinnings of the Hypotheses Testing process, the significance level and the importance of considering the Type I and II errors in testing hypotheses by providing demonstrative examples

- Explain the construct of regression models and it is affected in practice by violation of assumptions and “non-cleaned” data in empirical observations.

Application

- Apply various sampling techniques, describe the processes for defining and selecting sample data, calculate sample statistics and derive confidence intervals for the sample statistics.
- Perform test of hypothesis by properly selecting statistical methodologies defining null and alternative hypotheses determining critical values and interpret the results in context.
- Setup multiple linear regression models and derive and analyse regression results and residuals
- Handle the effect of qualitative indicators in regression, and apply proper transformations in the data to build suitable non-linear regression models
- Use statistical software to handle empirical data, perform statistical analysis listed above, accordingly.

Analysis

- Analyse statistical data properly, in order to identify distribution patterns, possible relationships among data attributes, contingencies, and interaction among various factors.
- Estimate relationships between explanatory and response variables, explain how estimators behave in terms of their probability distributions, test hypotheses on the relation between variables using F-values, t-values and p-values, and measure goodness of fit in a regression
- Analyse the statistical significance of a regression model, the contribution of the explanatory variables and the significance of categorical explanatory variables.
- Consider practical problems that arise in the estimation and analysis of the regression model, including multicollinearity, heteroscedasticity, presence of extreme or missing observations and take proper action to rectify the situation.

Synthesis

- Consolidate and interpret results of statistical analysis of empirical data in context in order to communicate relative information for supporting business decision making.
- Use the results of a regression model to identify and measure the single or interaction effects of independent variables on a dependent variable and interpret the effects in context.
- Select the most appropriate regression model after a comparison among alternatives, and interpret the regression results in context providing insight of potential limitations.

Evaluation

- Appraise the appropriateness of various sampling methods in collecting empirical data for specific purpose and evaluate the adequacy of a sample size, vis-à-vis acceptable sampling error, and desired confidence of the results.
- Describe the basic statistical characteristics of a population, based on evaluation of sample statistics.
- Evaluate relationships and patterns among the data using statistical techniques.
- Evaluate the “fitness” and the predictive power of regression model in making extrapolations
- Evaluate a regression model in terms of statistical significance and conformance with assumptions and detect potential problems with respect to violation of assumptions

General Competences

Taking into consideration the general competences that students/graduates must acquire (as those are described in the Diploma Supplement and are mentioned below), at which of the following does the course attendance aim?

*Search for, analysis and synthesis of data and information, by the use of technologies that are necessary according the case
Adapting to new situations*

*Project planning and management
Respect for difference and multiculturalism
Environmental awareness
Social, professional and ethical responsibility and*

<i>Decision-making</i> <i>Independent work</i> <i>Team work</i> <i>Working in an international environment</i> <i>Working in an interdisciplinary environment</i> <i>Introduction of innovative research</i>	<i>sensitivity to gender issues</i> <i>Critical consciousness, criticism and self- criticism</i> <i>Development of free, creative and inductive thinking</i>
<ul style="list-style-type: none"> • Search for, analysis and synthesis of data and information by the use of appropriate technologies • Adapting to new situations • Decision-making • Independent work • Team work • Working in an interdisciplinary environment • Introduction of innovative research • Project planning and management • Respect for diversity and multiculturalism • Environmental awareness • Critical consciousness, criticism and self- criticism • Development of free, creative and inductive thinking 	

3. MODULE CONTENT

<p>This Thematic Unit / Module is designed to introduce students to econometric techniques and their applications in economic analysis and decision-making. The main objective of the module is to train students in (i) handling economic data; (ii) quantitative analysis of economic models with probabilistic tools; (iii) econometric techniques, their application as well as their statistical and practical interpretation; (iv) implementing these techniques on any given econometric software. The module focuses on practical and conceptual issues involved in substantive applications of econometric techniques. Estimation and inference procedures are formally analysed for simple econometric models and illustrated by empirical case studies using real-life data. The module covers sampling, estimation and statistical inference techniques, linear and non-linear regression models.</p> <p>The subjects covered by this module are:</p> <ul style="list-style-type: none"> • Probabilities, Estimation, Sampling, Data analysis • Statistical Inference: Confidence Intervals Hypothesis Testing • Linear and Non-Linear Regression, Estimation, Prediction
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4. TEACHING METHODS--ASSESSMENT

<p>MODES OF DELIVERY</p> <p><i>Face-to-face, in-class lecturing, distance teaching and distance learning etc.</i></p>	<p>Distance education complemented with:</p> <ul style="list-style-type: none"> • 6 Group Consulting Meetings (GCM) of 2 hours each • Personal communication and feedback, where needed (consulting role of tutors)
<p>USE OF INFORMATION AND COMMUNICATION TECHNOLOGY</p> <p><i>Use of ICT in teaching, Laboratory Education, Communication with students</i></p>	<p>The potential of ICT is exploited in the digital platform eclass which constitutes a modern distance learning environment (e.g. a space for dialogue and creative activities).</p> <p>Remote meeting tools (Blackboard) and presentation software (powerpoint) are used in GCMs.</p> <p>Office automation tools, web browsers and e-readers for digital books are also used by the students.</p>

<p style="text-align: center;">MODULE DESIGN</p> <p><i>Description of teaching techniques, practices and methods: Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, Internship, Art Workshop, Interactive teaching, Educational visits, projects, Essay writing, Artistic creativity, etc</i></p> <p><i>The study hours for each learning activity as well as the hours of selfdirected study are given following the principles of the ECTS.</i></p>	Activity	Annual Workload
	6 GCMs (x 2 hours)	12
	12 interactive activities (12 x 2-2.5 ώρες)	25-30
	3 written assignments (3 x 25-30 ώρες)	75-90
	Exams	0
	Individual study ((13 weeks *~10 hours) (2 weeks *~20 hours))	138-168
	Total module workload (hours)	250-300
<p style="text-align: center;">STUDENT PERFORMANCE EVALUATION/ASSESSMENT METHODS</p> <p><i>Detailed description of the evaluation procedures.</i></p> <p><i>Language of evaluation, assessment methods, formative or summative (conclusive), multiple choice tests, short- answer questions, open-ended questions, problem solving, written work, essay/report, oral exam, presentation, laboratory work, other.....etc.</i></p> <p><i>Specifically defined evaluation criteria are stated, as well as if and where they are accessible by the students</i></p>	<ul style="list-style-type: none"> • Students are evaluated with 9, if they collect 90% of the possible grade, i.e. 90%*10=9, etc. • Passing rate <ul style="list-style-type: none"> ○ 50% of the Assignments and weekly interactive learning activities, Students are allowed to participate in the final exam of a Module, if they have overall collected the minimum grade (> = 50%) in their assignments and weekly interactive learning activities. ○ 50% of the Final exam <p>Grades with decimal points, are rounded to the nearest half unit.</p>	

5. SUGGESTED BIBLIOGRAPHY

<p>Compulsory Bibliography</p> <ul style="list-style-type: none"> • Kavussanos, M. G., Advanced Quantitative Analysis, Hellenic Open University, 2005 (available as PDF at the University) • Kavussanos, M. G., Giamouridis, D., Economic and Business Modelling, Hellenic Open University, 2005 (available as PDF at the University) • Digital Material available on e-class <ul style="list-style-type: none"> ○ Recording of Group Advisory Meetings ○ PowerPoint presentations on eClass ○ Notes on Excel Statistical Analysis Tools and Functions for Hypothesis Testing.pdf, ○ Notes (PDF) on MS Excel Regression Analysis routines and functions.pdf ○ Notes on SPSS hypothesis testing procedures ○ Notes (PDF) on SPSS Regression Analysis routines.pdf ○ Basic Concepts of Inference.pdf (available on e-class) ○ Confidence Intervals.pdf (available on e-class) ○ Sampling Distributions - Central Limit Theorem.pdf (available on e-class) ○ Test of Hypothesis.pdf (available on e-class) ○ Classical Inference: https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-041sc-probabilistic-systems-analysis-and-applied-probability-fall-2013/unit-iv/lecture-23/ (MIT Open Courseware) ○ Linear regression (videos, questions and notes: https://ocw.mit.edu/courses/sloan-school-of-management/15-071-the-analytics-edge-spring-2017/linear-regression/ (MIT Open Courseware)

Optional Bibliography

- The Best and Worst of Statistical Graphics: <http://euclid.psych.yorku.ca/SCS/Gallery/>
- Summarizing Numerical Data.pdf (available on e-Class)
- Introduction to Probability: <https://ocw.mit.edu/resources/res-6-012-introduction-to-probability-spring-2018/index.htm> (MIT Open Courseware)
- Summarizing Numerical Data: https://ocw.mit.edu/courses/sloan-school-of-management/15-075j-statistical-thinking-and-data-analysis-fall-2011/lecture-notes/MIT15_075JF11_chpt04.pdf (MIT Open Courseware)
- Berenson, M.L., Levine, D.M. and K.A. Szabat. Basic Business Statistics: Concepts and Applications, (13th Edition). Pearson, 2015.
- Brooks, C. Introductory Econometrics for Finance (3rd Edition). Oxford: Oxford University Press, 2014.
- Stock, J.H. and M.W. Watson. Introduction to Econometrics (3rd Edition). New York: Pearson Education, 2014
- Field, Andy, Discovering Statistics Using SPSS