

COURSE LAYOUT

1. GENERAL

SCHOOL	APPLIED ECONOMICS AND SOCIAL SCIENCES		
DEPARTMENT	AGRICULTURAL ECONOMY AND RURAL DEVELOPMENT		
STUDY LEVEL	<i>Undergraduate</i>		
COURSE CODE	105	SEMESTER	1 st
COURSE TITLE	STATISTICS (OBLIGATORY)		
INDEPENDENT TEACHING ACTIVITIES		WEEKLY TEACHING HOURS	ECTS
Lectures		4	4
COURSE TYPE	Infrastructure/ General knowledge/ Skills development		
PREREQUISITES			
LANGUAGE	Greek		
IS THE COURSE OFFERED for ERASMUS STUDENTS?	Yes (in Greek)		
COURSE WEB PAGE			

2. LEARNING OUTCOMES

Learning Outcomes
<p>After this course, the student is expected to be able to:</p> <ul style="list-style-type: none"> • distinguish stochastic and deterministic phenomena and experiments • using enumeration methods and basic probability tools • apply simple probability calculus • recognize the practical value and importance of probabilities in the understanding of stochastic phenomena and experiments • describe and summarize data • translate a research question into a statistical hypothesis when given a data group and the type of experimental design or sampling procedure • apply estimation and testing methods in order to make data-based decisions • identify the selected method's assumptions and keep in mind that it is required to apply checks for them • comprehend and interpret correctly the statistical significance • interpret results correctly, effectively, and in context without relying on statistical jargon • comprehend the notion of uncertainty which is always contained in statistical inference • critique data-based claims and evaluate data-based decisions • complete a research project that employs simple statistical inference comply to ethical issues.

General Competences

- 1) Retrieve, analyze and synthesize data and information, with the use of necessary technologies.
- 2) Adapt to new situations.
- 3) Make decisions.
- 4) Work autonomously.
- 5) Create new research ideas.
- 6) Advance free, creative and inductive thinking.

3. COURSE CONTENT

- 1) Statistical approach: a brief overview.
- 2) Useful counting rules (multiplication principle, permutations, k-permutations, combinations).
- 3) Practical notion of probability; basic probability tools.
- 4) Conditional probability (multiplication rule; law of the total probability; Bayes theorem); Independence.
- 5) Random variables (cumulative distribution function; discrete and continuous random variables; probability function; probability density function; mean and variance).
- 6) Useful discrete distributions (Bernoulli; Binomial; Poisson).
- 7) Useful continuous distributions (Normal; χ^2 ; t and F).
- 8) Central limit theorem.
- 9) The role of probability in statistics.
- 10) Descriptive statistics (frequency table; numerical descriptive measures; bar chart; pie chart; box plot; histograms).
- 11) Sampling distributions.
- 12) Estimation; point estimation (properties of an estimator); interval estimation (confidence intervals for a (difference of) population mean (s) or proportion (s));
- 13) Testing hypotheses for a (difference of) population mean (s) or proportion (s));
- 14) Goodness-of-fit test; Chi-Square test of independence.
- 15) Analysis of variance (single-factor ANOVA; two-factor ANOVA).

4. TEACHING and LEARNING METHODS - Evaluation

TEACHING METHOD	Live, face to face teaching in the classroom*	
	*Due to the special circumstances (COVID-19), synchronous distance teaching can be applied and educational material for asynchronous distance teaching has been uploaded in the Open e-class platform.	
USE OF INFORMATICS and COMMUNICATION TECHNOLOGIES	Educational material, updates and announcements available via Open e-class platform.	
TEACHING ORGANISATION	<i>Activity</i>	<i>Work Load (hours)</i>
	Lectures	52 hours
	Individual study	48 hours
	Total contact hours and training(25 hours per ECTS)	100 hours (5 ECTS)

STUDENTS EVALUATION	Written examination of different difficulty, based on the lectures offered, containing: - Problems and/or exercises. - Comprehension questions.
----------------------------	---

5. BIBLIOGRAPHY

1. Παπαδόπουλος, Γ. Κ., *Εισαγωγή στις Πιθανότητες και τη Στατιστική*, Πανεπιστημιακές Σημειώσεις, Έκδοση Γ.Π.Α., 2013.
2. Κουινιάς, Σ., Κολυβά-Μαχαίρα, Φ., Μπαγιάτης, Κ. και Μπόρα-Σέντα, Ε., *Εισαγωγή στη Στατιστική*, Εκδόσεις Χριστοδουλίδη, Θεσσαλονίκη
3. Κούτρας, Μ. Β., *Εισαγωγή στις Πιθανότητες-Θεωρία και Εφαρμογές*, Εκδόσεις Σταμούλη, 2002.
4. Larsen, R. J. and Marx, M. R., *An Introduction to Mathematical Statistics and its Applications*, Pearson Prentice Hall, Fourth Edition, 2006.
5. Zar, J.H., *Biostatistical Analysis*, Prentice Hall, Fifth Edition, 2010.