COURSE LAYOUT

1. GENERAL

SCHOOL	APPLIED ECONOMICS AND SOCIAL SCIENCES ANIMAL BIOSCIENCES
DEPARTMENT	AGRICULTURAL ECONOMICS AND RURAL DEVELOPMENT ANIMAL SCIENCE
STUDY LEVEL	*Undergraduate – Elective course*
COURSE CODE	3445 **SEMESTER** 6th
COURSE TITLE	INTRODUCTION TO THE R LANGUAGE FOR DATA SCIENCE (OPTIONAL)

INDEPENDENT TEACHING ACTIVITIES	WEEKLY TEACHING HOURS	ECTS
Theory: Lectures	2	2
Laboratory: Use of Software Tools	3	3
Total	5	5

COURSE TYPE	Scientific Area (M4.017) Skills Development
PREREQUISITES	
LANGUAGE	Greek
IS THE COURSE OFFERED for ERASMUS STUDENTS?	Yes (in Greek)
COURSE WEB PAGE	https://oeclass.aua.gr/eclass/courses/6120/

2. LEARNING OUTCOMES

Learning Outcomes

Upon successful completion of the course, students will be able to:
- understand the basic principles of the R language and its use in Data Science.
- perform data processing and statistical analysis tasks using the R language.
- apply data analytics techniques.
- organize and process data with the help of appropriate data structures.
- manage big data using R's built-in libraries.
- create graphs and visualize data.

The course is aimed at students who have little or no experience in programming and is taught using numerous examples. Upon completion, students acquire a useful competence to add in their CV.

> **Commented [KD1]:** To double check

General Competences
- Search, analysis and synthesis of data and information by use of the necessary technologies.
- Adaptation to new situations.
- Decision making.
- Individual work.
- Work in a multidisciplinary environment.
- Development of judgment and self-judgment.
- Advancement of free, creative and deductive thinking.

3. COURSE CONTENT

Theory
1. Introduction to the R language for Data Science,
2. Data Types, Numeric and Logical Operators
3. Control Structures, Data Structures
4. Functions, Packages
5. Introduction to Exploratory Data Analysis
6. Data Preprocessing and Quality
7. Descriptive Statistics, Data Visualization
8. Correlation Analysis

9. Special Topics in Machine Learning and Artificial Intelligence **Laboratory** Familiarization with RStudio. Examples in the analysis of actual datasets in agricultural economics, as well as in plant and animal production.	

10. TEACHING and LEARNING METHODS - Evaluation

TEACHING METHOD	In Classroom and in Laboratory (face-to-face).
USE OF INFORMATICS and COMMUNICATION TECHNOLOGIES	Exploitation of Information and Communication Technologies in teaching, in laboratory training and in the communication with students. Use of the open source R compiler and the corresponding RStudio development environment. Use of integrated e-learning system. Communication with students via open eclass platform and e-mail.
TEACHING ORGANISATION	<table><tr><td>*Activity*</td><td>*Work Load*</td></tr><tr><td>Lectures</td><td>26 hours</td></tr><tr><td>Laboratory work</td><td>39 hours</td></tr><tr><td>Group and/ or individual projects</td><td>15 hours</td></tr><tr><td>Individual study</td><td>45 hours</td></tr><tr><td>***Total contact hours and training***</td><td>***125 hours***</td></tr></table>
STUDENTS EVALUATION	I. Final written examination (50%): Writing a computer program that solves a practical data analysis problem. It also includes short essay questions. II. Laboratory exercises (50%): Writing simple programs related to the material taught. The final grade is common for theory and laboratory and is calculated as the sum of the above individual assessments. Rating Scale: 0-10 Minimum Grade: 5 The assessment criteria are explicitly defined and can be found on the eClass page of the course. Students can have access to their written examination and software code. If required, students' evaluation can also be realized remotely through the eClass platform for the written examination, and through video conferencing tools for presentation of projects or oral examinations.

11. BIBILIOGRAPHY

-Proposed literature:
1. Nikolaou, Ch. Data Analysis with the R Language. Disigma Publications, 2023.
2. Verykis, V., Kaglis, V., and Stavropoulos, I. Data Science through the R Language (e-book). Association of Greek Academic Libraries. Kallipos Repository, 2015.
3. Wickham, H., Grolemund, G. R for Data Science. Kleidarithmos Publications, Edition: 1st/2022.