**COURSE LAYOUT**

1. **GENERAL**

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| **SCHOOL** | APPLIED ECONOMICS AND SOCIAL SCIENCES |
| **DEPARTMENT** | AGRICULTURAL ECONOMICS AND RURAL DEVELOPMENT |
| **STUDY LEVEL** | *Undergraduate - elective* |
| **COURSE CODE** | **3709** | **SEMESTER** | 5th  |
| **COURSE TITLE** | BUSINESS INTELLIGENCE SYSTEMS  |
| **INDEPENDENT TEACHING ACTIVITIES** | **WEEKLY TEACHING HOURS** | **ECTS** |
| **Theory:** Lectures | 3 |  |
| **Laboratory:** Use of Software Tools | 2 |  |
| **Total** | 5 | 5 |
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| **COURSE TYPE** | Scientific Area  |
| **PREREQUISITES** |  |
| **LANGUAGE** | Greek |
| **IS THE COURSE OFFERED for ERASMUS STUDENTS?** | Yes (in Greek) |
| **COURSE WEB PAGE** | <https://mediasrv.aua.gr/eclass/courses/AOA198/> |

1. **LEARNING OUTCOMES**

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| **Learning Outcomes** |
| Upon successful completion of the course the student will be able to:* Understand the meaning and characteristics of an intelligent system,
* Understand the concept of an intelligent training system,
* Understand and recognize the differences between OLTP Databases and Data Warehouses and create Data Warehouses according to the steps of the ETL (Extract, Transform and Load) process.
* Diagnose problems that have occurred as a result of the data integration and transformation.
* Create well structured dimension tables and fact tables and use them to create star and snowflake schemata.
* Distinguish and choose the most appropriate method for knowledge extraction through a large number of data,
* Acquire the necessary skills to exploit ready-made tools for data mining , in order to develop an intelligent system,
* Combine results of classification, clustering and association rules and will be able to end up with the production of new knowledge.
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| **General Competences** |
| * Search, analysis and synthesis of data and information by use of the necessary technologies.
* Adaptation to new situations.
* Decision making.
* Autonomous work.
* Team work.
* Work in a multidisciplinary environment
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1. **COURSE CONTENT**

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| **Theory**1. A survey of relational Databases and of Data Warehouses. Design and implementation of Data Warehouses.
2. Examples of data integration and data interchange scenarios. Extraction process, transformation process and ETL data insertion process. Dealing with transformation problems and missing information in Databases.
3. Star schemata and snowflake schemata. Dimension Tables and Fact Tables. Multidimensional data models – hypercubes. On-Line Analytical Processing (OLAP) and relevant operations.
4. Data visualization
5. Methods and techniques of data mining.
6. Classification (classification models, types and evaluation of classifiers).
7. Clustering (clustering concept, set of basic clustering algorithms).
8. Basic Association Rules.

**Laboratory**1. Open-source software for creating and managing Data Warehouses.
2. Open source software for OLAP.
3. Use of tools for data mining (WEKA, Analysis Services).
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1. **TEACHING and LEARNING METHODS - Evaluation**

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| **TEACHING METHOD** | In Classroom and in Laboratory (face-to-face) or Distance Learning (if required). On the web page of the course there is posted educational material for asynchronous distance learning. |
| **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 dedicated software.Use of integrated e-learning system.Communication with students via open eclass platform and e-mail.  |
| **TEACHING ORGANISATION** |

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| *Activity* | *Work Load* |
| Lectures | 26 hours) |
| Laboratory work | 39 hours |
| Group and/ or individual projects | 15 hours |
| Individual study  | 45 hours |
| ***Total contact hours and training***  | ***125 hours*** |

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| **STUDENTS EVALUATION** | Ι.Final written examination (40%): Questions of varying difficulty.II. Weekly Laboratory exercises (10%): Questions and problems concerning the study material of the week.III. Group or Individual Project (50%): Two (2) projects concerning the implementation of scenarios solving real practical problems. The evaluation concluded with an oral presentation.The final grade is the sum of the above individual evaluations.Rating Scale: 0-10Minimum Grade: 5The assessment criteria are explicitly defined and can be found on the eClass page of the lesson. Students can have access to their written examination and software records.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. |

1. **BIBILIOGRAPHY**

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| *-* ***Proposed literature:***1. Tan Pang - Ning, Steinbach Michael, Kumar Vipin, Introduction to Data Mining, 2nd Edition, 2018, A. TZIOLA & SONS PUBLICATIONS SA, Athens (in Greek).
2. ΑL. NANOPOULOS, G. MANOLOPOULOS, INTRODUCTION TO DATA MINING AND DATA WAREHOUSES, 2008, PUBLICATIONS OF NEW TECHNOLOGIES Ltd (in Greek).
3. Kyrkos E. Business Intelligence and Data Mining (Book Code in Eudoxus: 320088) Version: 1/2016 ISBN: 978-960-603-109-0. E-book. Publisher: Greek Academic Electronic Textbooks - "Kallipos" Repository (in Greek).
4. Stalidis George, Kardaras Dimitris. Data management and business intelligence. (Book Code in Eudoxus: 320080). Edition: 1/2016. ISBN: 978-960-603-398-8. Electronic Book, Publisher): Greek Academic Electronic Books - "Kallipos" Repository (in Greek).

***-Related scientific journals:***1. DATAMINE - Data Mining and Knowledge Discovery
2. IDA - Intelligent Data Analysis
3. IJDWM - International Journal of Data Warehousing and Mining
4. MLDM - Transactions on Machine Learning and Data Mining
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