**MSc in Artificial Intelligence and Data Analytics**

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| **ΜΑΘΗΜΑ “Διερευνητική ανάλυση και οπτικοποίηση δεδομένων”AIDA104** | |
| **code** | **AIDA104** |
| **title** | **Exploratory data analysis and visualization** |
| **type (compulsory/optional)** | compulsory |
| **cycle (first/second/third)** | second |
| **year of study when the component is delivered (if applicable)** | 2022-23 |
| **semester/trimester when the component is delivered** | winter |
| **number of ECTS credits allocated** | 7,5 |
| **name of lecturer(s), with information about how, when and where to contact them.** | Georgios Evangelidis |
| **learning outcomes** | The main objective of data analysts is to acquire knowledge from data. One of their main tools is to intuitively understand the data before proceeding to the analysis of what happened in the past or to predict what will happen in the future. This process is called Exploratory Data Analysis and involves a iterative application of techniques for analyzing, investigating and visualizing data. ● Skills o Use of data analysis tools such as R and Python and data visualization tools like dashboards. ● Competencies o Management and exploratory analysis of data of any type (alphanumeric, numerical, categorical, spatial, graph) o Visualization of data of any type (diagrams, maps, networks) o Ability to interpret and analyze results and create interactive dashboards. |
| **mode of delivery (face-to-face/distance learning etc.)** | face to face |
| **prerequisites and co-requisites (if applicable)** |  |
| **course content** | Organization and preparation of data (import, transform, clean). Principles of graph analysis. Exploratory graphs. Data instance reduction and feature selection techniques for the visualization of data of high dimensions. Data analysis (univariate and multivariate). Data visualization using dashboards. Storytelling with data. Advanced visualization techniques: maps, networks, high-dimensional data, text, interactive graphs, animation and visual analytics. |
| **recommended or required reading and other learning resources/tools** | ● NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/, 2018. ● Edward R. Tufte, “The Visual Display of Quantitative Information”, 2nd ed., Graphics Press/Amazon, 2001. ● William McKinney, “Python for Data Analysis”, O’Reilly Media, 2012. ● Robert Kabacoff, “R in Action: Data Analysis and Graphics with R”, 2nd ed., Manning Publications, 2015. ● Julie Steele, Noah Iliinsky, “Beautiful Visualization, Looking at Data Through the Eyes of Experts", O’Reilly Media, 2010. ● Cole Nussbaumer Knaflic, “Storytelling With Data: A Data Visualization Guide for Business Professionals”, Amazon, 2015. ● John W. Tukey, “Exploratory Data Analysis”, Pearson, 1977. |
| **planned learning activities and teaching methods** | Lectures, with the use of ICT equipment |
| **assessment methods and criteria** | Projects and final written exams |
| **language of instruction** | Greek or English |