DEGREE PROGRAM IN TECNOLOGIE E LINGUAGGI DELLA COMUNICAZIONE - TECHNOLOGIES AND LANGUAGES OF COMMUNICATIONS (LM-59) CURRICULUM IN INTERACTION DESIGN

A.Y. 2023/2024

Course Data Analysis & Visualization
SDS SEC-S/01
ETCS 6
Course modules None
Year I year
Semester II semester
Professor(s) Flaminia Musella
e-mail f.musella@unilink.it
Office hour By appointment agreed by e-mail.

LEARNING OUTCOMES

By the course, students will be able to manage data from the gathering to the visualization, passing by the pre-processing and the middle-analysis.
In detail, the fundamental themes are:
- Data gathering
- Data pre-processing and engineering
- Data analysis
- Data visualization
- Misleading visualizations
- Storytelling with data

The analysis will be developed in Microsoft Power BI.

Active participation during the course and individual study will allow the student to achieve the following learning outcomes:

1. **KNOWLEDGE AND UNDERSTANDING SKILLS:** students will be able to gather data, to organize them before the analysis, the main analysis to synthesize them and, finally, to properly visualize them by graphs to support a telling with them.
2. **APPLIED KNOWLEDGE AND UNDERSTANDING SKILLS:** the course is mainly applied to real data sets. In details, the course is structured by case studies by means of the student may learn the proper technicalities to detect issues and the ability to visualize data by means of Microsoft Power BI
3. **AUTONOMY JUDGMENT:** Being able to analyse data by the course in an independent and critical way. Knowing how to evaluate tools and methods autonomously and critically for the data visualization.
4. **COMMUNICATION SKILLS:** Being able to properly communicate data without misleading; acquiring the ability for discussion by choosing the best tool to telling a data story.
5. **LEARNING ABILITY:** Acquiring the ability to explore and explain data and to visualize them.

DETAILED PROGRAM

DEGREE PROGRAM IN TECNOLOGIE E LINGUAGGI DELLA COMUNICAZIONE - TECHNOLOGIES AND LANGUAGES OF COMMUNICATIONS (LM-59) CURRICULUM IN INTERACTION DESIGN

A.Y. 2023/2024

I. Data Engineering (Microsoft)
• Introduction to data and data sources
• Data architectures and reference patterns
• Pre-processing techniques to transform/enrich data
• Deep dive on the visualization part and powerBI
• Practices

II. Data Visualization with Microsoft Power BI
• Tables and cross tables
• Charts
• Plots
• Graphs for distribution
• Map graphs
• Practices

III. Storytelling with data
• The importance of context and of the audience
• Cluttering and strategies for visualizing data
• Basics of narrative
• Case studies

RECOMMENDED PRE-REQUISITES (IF ANY)

None

TEACHING METHODOLOGIES

The educational activities will be carried out through lectures and practical learning.

FINAL EXAMINATION METHODOLOGIES

The exam is written/practice, based on a project work developed during the course. The project consists in a report on data describing a social and contemporary phenomenon with the aim to evaluate the acquired capability during the course. The teacher may also ask questions not directly related to the case study dealt with. For non-attending students, elaborations on pc will be required during the exam.

EVALUATION CRITERIA

At the end of the course, the following skills of the student will be evaluated:
1. **KNOWLEDGE AND UNDERSTANDING SKILLS:** it will be evaluated the students' capacity to analyse data and to proper select the data visualization tool.
2. **APPLIED KNOWLEDGE AND UNDERSTANDING SKILLS**: the student will be evaluated based on his/her ability to manage the software.
3. **AUTONOMY JUDGMENT:** the student will be evaluated in the basis of his/her sensitivity to comment data.
4. **COMMUNICATION SKILLS:** the student will be evaluated on the capability to select the proper tool for setting the data story telling.
5. **LEARNING ABILITY:** the student will be evaluated on the capability to select the proper tool for setting the data story telling.

DEGREE PROGRAM IN TECNOLOGIE E LINGUAGGI DELLA COMUNICAZIONE - TECHNOLOGIES AND LANGUAGES OF COMMUNICATIONS (LM-59) CURRICULUM IN INTERACTION DESIGN

A.Y. 2023/2024

FINAL GRADING INFORMATION AND CRITERIA

Maximum score is given for students perfectly comfortable with the tool of analysis and able to collect, pre-process, analyse and visualize data but also to be able to proper comment them.

The final score is expressed in thirtieth grade, with the possibility of honors. The final score reflects the student's preparation as follows:

Score	Description
< 18 not sufficient	Fragmentary and superficial knowledge of contents, errors in applying concepts, insufficient exposure.
18-20	Sufficient but still general knowledge of contents, elementary exposure, uncertainties in the application of theoretical notions.
21-23	Appropriate, but not deep, knowledge of contents, good ability in applying theoretical notions as well as presenting them in a simple way.
24-25	Appropriate and vast knowledge of contents, discrete ability in applying them, good ability in presenting notions in a comprehensive way.
26-27	Precise and comprehensive knowledge of the topics, good ability in applying the acquired knowledge, good analytical skills, clear and correct exposure.
28-29	Extensive, comprehensive and deep knowledge of contents, good applicative skills, good ability of analysis and synthesis, confident and correct exposure.
30 30 with honors	Very broad, comprehensive and deep knowledge of the contents, well-established ability to apply the acquired notions, excellent ability of analysis, synthesis as well as ability to create interdisciplinary links, fluency of exposure.

COURSE MATERIAL

Teaching materials is based on slides and case studies elaborated by the teachers. Moreover, textbooks are listed below:

1. https://download.microsoft.com/download/0/8/1/0816F8D1-D1A5-4F60-9AF5-BC91E18D6D64/Microsoft_Press_ebook_Introducing_Power_BI_PDF_mobile.pdf
2. Arnold, Jeremey. Learning Microsoft Power BI: Transforming Data Into Insights. Cina, O'Reilly Media, 2022.
3. Data Visualization and Analysis with Power BI (DA-100) (microsoft.com)
4. Knaflic, C. N. (2015). Storytelling with Data: A Data Visualization Guide for Business Professionals. Germania: Wiley.

DEGREE PROGRAM IN TECNOLOGIE E LINGUAGGI DELLA COMUNICAZIONE - TECHNOLOGIES AND LANGUAGES OF COMMUNICATIONS (LM-59) CURRICULUM IN INTERACTION DESIGN

A.Y. 2023/2024

OTHER ADVICES

Students belonging to the 'part-time/workers' category or being unable to take part in the lessons are suggested to directly contact the professor in order to analyze, together, specific training needs.