

Course Syllabi

1. TICS-00038 DATA SCIENCE

2. 96 credits hours.

3. Bibliography

- Ciencia de datos, John D. Kelleher, Brendan Tierney, 2021
- Python Data Science Handbook: Tools and Techniques for Developers, Jake VanderPlas, 2016
- Estadística práctica para ciencia de datos con R y Python, Peter Bruce, Andrew Bruce, 2022
- Introduction to Data Science: A Python Approach to Concepts, Techniques and Applications (Undergraduate Topics in Computer Science), Laura Igual, Santi Seguí, 2024
- Visual Analytics with Tableau, Alexander Loth, Nate Vogel, Sophie Sparkes, 2019

4. Specific Course Information

- This theoretical-practical subject introduces the student to the process of understanding and analyzing large amounts of data that are generated in computer systems and outside them, using the principles that govern data science for analysis and interpretation. It provides students of the IT career with the theoretical and practical tools to implement descriptive and predictive models according to the various areas of the industry according to nature d and data, thus generating real solutions to real problems. The student at the end of the course, will be able to manage, extract the information and be able to generate systems for decision making based on the analyses obtained, making use of various computer tools.
- Prerequisites:
 - TICS-00032 DATA WAREHOUSE AND DATA MINING
 - TICS-00062 NEURAL NETWORKS
 - TICS-00054 COMMUNITY SERVICE PRACTICES
 - TICS-00065 DISTRIBUTED SYSTEMS
 - TICS-00059 WEB PROGRAMMING
 - TICS-00048 HUMAN-COMPUTER INTERACTION

5. Learning Objectives of the Course

- This program in data science allows you to know and develop the main technical skills to contribute as a team member to a data science project. These skills are becoming more and more desirable for the labor market and that is why the topics include basic knowledge in descriptive models based on statistics, predictive models based on machine learning, and techniques to integrate, explore and prepare data, both structured and unstructured, use and the programming languages such as Python, R, among others, and data manipulation and analysis libraries.
 - Introduce the basic notions on data science, emphasizing the tasks of a data scientist, the tools he uses and a methodology to carry out the data analysis process.
 - Strengthen the basic notions on descriptive and inferential statistics for the description and interpretation of data analysis.
 - Develop multi
 - way integrations
 - To analyze problems in a real context with the purpose of using a methodology to provide information to make decisions and resolve them.
 - To develop quality dashboards using the basic principles for the development of large data volume

visualizations.

- To develop computer solutions using the processing of large volumes of data through supervised and unsupervised algorithms of machine learning.

b. Learning Outcomes

- Create display boards using a specific methodology for processing large volumes of data
- Develop computer solutions using large volumes of data to support decision-making
- Develops data warehouses that integrate multiple data sources
- It uses descriptive and inferential statistics in the interpretation of analyses of large volumes of data
- It proposes solutions to problems in a real context using decision-making methodologies.
- It uses descriptive and inferential statistics in the interpretation of analyses of large volumes of data
- It includes the basic notions of data science and the tasks, tools, methodologies used in the data analysis process

6. Course Topics

- Induction to the subject
- Introduction to data science
- Statistics for data science
- Methodology for data analysis and computer system design
- Dashboards for data visualization
- Development of applications for data science