Lisbon School of Economics & Management
Universidade de Lisboa

U LISBOA
UNIVERSIDADE DE LISBOA

PROGRAMMING FOR DATA SCIENCE

Academic Year: 2026/2026

Introduction

- Learning Objectives
- Program
- Bibliography
- Evaluation rules
- Professor

Course Objectives

The student should obtain the following skills:

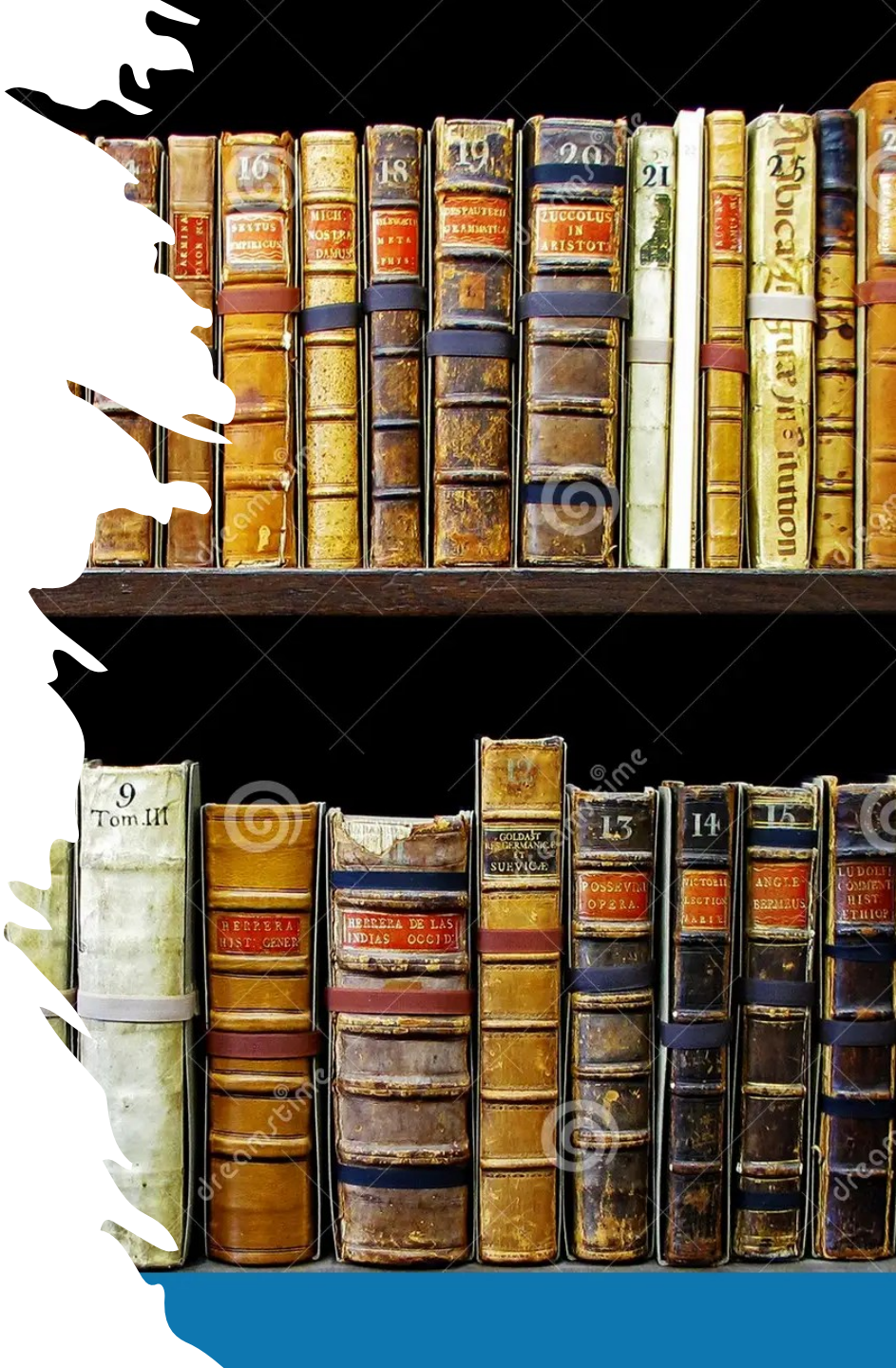
- Consolidate main programming concepts
- Understand programming techniques to manipulate and visualize data
- Use programming languages to explore data
- Create models supported in data.

Course Syllabus

- **I. Overview to Programming Concepts**
- **II. Main libraries used in Data Science.**
  - 1. data analysis and statistics
  - 2. data visualization
  - 3. Networks
  - 4. image manipulation and text
  - 5. machine learning
  - 6. Deployment and Web
- **III. Data Science.**
- **Projects Presentation**

Bibliography

- Albon, C. (2018). *Machine learning with python cookbook: Practical solutions from preprocessing to deep learning*. " O'Reilly Media, Inc.".
- Bird,S, Klein, E. & Loper, E. (2019) Natural Language Processing with Python – Analyzing Text with the Natural Language Toolkit http://www.nltk.org/book/
- Hagberg, A., Swart, P. J., & Schult, D. A. (2020) NetworkX Reference, Release 2.5 https://networkx.org/documentation/stable/_downloads/networkx_reference.pdf
- Martins J. P. (2015) Programação em PYTHON: Introdução à Programação Utilizando Múltiplos Paradigmas, IST Press.
- McKinney, W., & Team, P. D. (2021). Pandas-powerful Python data analysis toolkit 1.2.2. Download from: https://pandas.pydata.org/docs/pandas.pdf
- **Libraries websites:**
- https://numpy.org/
- https://pandas.pydata.org/
- https://www.statsmodels.org/stable/index.html
- https://scikit-learn.org/stable/
- https://matplotlib.org/stable/index.html
- https://seaborn.pydata.org/
- https://networkx.org/
- http://www.nltk.org/
- https://scikit-image.org/
- https://opencv.org/



Accessment

- Test: 30%
- Quiz and labs: 30%
- Team Work: 40%

Deadlines

(May be subject to change: Confirm in the worksheet)

- 1. Team registration (19/02)
- 2. Project Statement (3/03)
- 3. Project Proposal presentation (17/03)
- 3. Project Submission (16/04)
- 5. Project Presentation (21 and 23/04)

What I expect from students

- Classes must be complemented with individual study hours.
- Act with ethics towards work and others.
- Learn and participate in class activities with enthusiasm
- Be respectful
  - *listen | share airtime |open mind |use of personal devices only when required or during breaks*
- Be Responsible:
  - *Arrive on time | follow class activities | help others (but do not do their work) | integrate your colleagues in the group work*
- Be a problem solver
  - *ask questions | Share ideas |embrace the struggle of learning | Stay positive!*

AI Support

- You have many tools that may be used (Chat-GPT, gemini.google.com, scispace.com, ...)
- But must be used ethically

- Use to learn
- Evaluate

Prof. **Carlos J. Costa**, PhD

Associate Professor with Habilitation

email: cjcosta@iseg.ulisboa.pt

Rua Miguel Lupi, nº 20 – gabinete 318

https://www.linkedin.com/in/costacarlos/

https://scholar.google.com/citations?user=CpxIHn0AAAAJ&hl