Syllabus
2024 - 2025

GENERAL INFORMATION

Data of the subject	
Subject name	Telemedicine and Data Analysis
Subject code	DTC-GITT-317
Mainprogram	Bachelor's Degree in Engineering in Telecommunication Technologies
Credits	6,0 ECTS
Type	Optativa (Grado)
Department	Department of Telematics and Computer Sciencies

Teacher Information	
Teacher	
Name	Dido Carrero Muñiz
Department	Department of Telematics and Computer Sciencies
EMail	dcarrero@icai.comillas.edu

DESCRIPTION OF THE SUBJECT

Contextualization of the subject

Course contents

Contents

Parte I: Telemedicine

1. Introduction to telemedicine and telemonitoring.

  1.1 Data acquisition and storage.

  1.2 Medical epidemiology.

  1.3 Telediagnosis.

Parte II: Biomedical data treatment

2. Supervised learning.

  2.1 Classification algorithms.

  2.2 Regression algorithms.

3. Analysis of biomedical time series.

4. Unsupervised learning.

  4.1 Clustering.

4.2 Dimensionality reduction.

EXERCISES

All the exercises are conducted using biomedical data, either from public databases or collected by the students (Health Apps, Google Fit, sports wristbands, etc.).

Exercise 1: Classification

Exercise 2: Regression

Exercise 3: Time Series

Exercise 4: Clustering

Exercise 5: Dimensionality Reduction

EVALUATION AND CRITERIA

Evaluation activities	Evaluation criteria	Weight
Exams: • Midterm exam • Final exam	• **Midterm exam (25%):** understanding the fundamental concepts of computer science and programming. • **Final exam (40%):** omputational and abstract thinking for problem-solving through programming will be evaluated.	65
Practical sessions: • Collaborative challenges • Homework tasks • Practical tasks	Attitude, participation, and completion of weekly exercises and challenges in collaborative and individual sessions will be assessed. Additionally, the report for each exercise will also be evaluated.	20
Final project	Final project that the student will hand in at the end of the semester.	15

Grading

The final grade for both regular and extraordinary terms of the course will depend on the evaluation of the following activities:

- **Final Grade** = 25% Midterm Exam + 40% Final Exam + 20% Weekly Practices + 15% Final Project
- To pass the course, students must obtain at least 5 points out of 10 on the final exam and the final project, both in the regular and extraordinary terms.
- Missing 15% or more of the in-person hours of this course may result in the inability to participate in both regular and extraordinary terms.
- The final project will be conducted **individually**.
- Weekly practices are submitted individually, although teamwork may be required during class.
- The **extraordinary** exam combines the grades for the Midterm and Final exams.

BIBLIOGRAPHY AND RESOURCES

Basic References

• C. Bishop (2007). Pattern Recognition and Machine Learning. Springer.

• T. Hastie, R. Tibshirani, J. Friedman (2017) The Elements of Statistical Learning: Data Mining, Inference and Prediction. Springer.

• A. Gelman, J. Carlin, H. Stern, D. Dunson, A. Vehtari, D. Rubin (2021). Bayesian Data Analysis (3rd edition).

• S. Mitra, et al. Introduction to Machine Learning and Bioinformatics (2008). (Chapman & Hall/CRC Computer Science & Data Analysis, Chapman and Hall/CRC (1st edition)
Publication date : June 5, 2008