# Course unit: Data and Decisions

## Course metadata

- Title in French: Données et Décisions
- Course code: tba
- ECTS credits: 3
- Teaching hours: 72h
- Type: advanced course
- Language of instruction: French
- Coordinator: tba
- Instructor(s): François Brucker, Michaël Chalamel (L'Oréal), Franck Chevalier (EY), Emmanuel Daucé, Christophe Pouet
- *Last update 24/03/2021 by C. Pouet*

## Brief description

This course unit is divided into three parts:

- ** Statistical learning ** (24 hours) taught by Christophe Pouet.
- ** Python for data science ** (24 hours) taught by François Brucker and Emmanuel Daucé.
- ** Advising using data ** (24 hours)taught by Michaël Chalamel and Franck Chevalier.

## Learning outcomes

- Know how to model and program an estimation problem
- Know how to model and program a classification problem
- Know how to acquire and aggregate data
- Know how to use data to take decisions
- Understand the importance of data governance and data quality

## Course content

### Statistical learning

1. Introduction
    1. Classical problems: regression, classification
    2. Supervised, unsupervised and semi-supervised learning
    3. Curse of dimensionality
2. Regression
    1. Multiple linear regression, OLS method
    2. Shrinkage-type methods (LASSO, Ridge)
    3. k-nearest neighbors
3. Classification
    1. Logistic regression
    2. k-nearest neighbors

3. SVM
4. Rosenblatt perceptron and neuronal networks

**Python for data science**

1. Dataframe: data exploration and data description
2. Spotting patterns using factor
    1. Principal Component Analysis
    2. Correspondence analysis
3. Prediction using trend analysis
    1. Linear regression
    2. Logistic regression
4. Data classification
    1. Classification using partitions
    2. Hierarchical methods

**Data-driven decision making**

1. What is data?
2. How do we take decision?
3. Data governance and data quality
4. How to develop data-based decision making?
5. Data platform and data architecture

## Bibliography

Check the availability of the books below at Centrale Méditerranée library.

1. Statistical Learning
    - James G., Witten D., Hastie T. and al. (2013). An introduction to statistical learning: with applications in R. New York: Springer
    - Hastie T., Tibshirani R. and Friedman J. (2013). The elements of statistical learning: data mining, inference, and prediction. New York: Springer.
    - Cornillon P-A., Matzner-Løber E. et al. (2010). Régression avec R. Paris: Springer.
2. Python for data science
    - Jannach, D., Zanker, M., Felfernig, A. and Friedrich, G. (2010). Recommender Systems: An Introduction. Cambridge.
3. Advising using data
    - tba

From:
https://wiki.centrale-med.fr/mmefi/ -

Permanent link:
**https://wiki.centrale-med.fr/mmefi/en:ddefidode**

Last update: **2024/06/28 15:18**