

# Management of Data Science and Business Workflows

## Lecturer

Dimitrios SACHARIDIS (Coordinator)

## Course mnemonic

INFO-H420

## ECTS credits

5 credits

## Language(s) of instruction

English

## Course period

First term

## Campus

Solbosch

## Course content

This course introduces basic concepts for managing workflows in data science applications and business processes. The first part of the course focuses on **business process management** and considers identification, modeling, analysis, simulation, redesign, and mining based on the Business Process Modeling and Notation (BPMN) workflow language. The second part focuses on **data science workflows** and discusses modeling, execution, and optimization, and also introduces various topics on **responsible data science**.

During the course the students have to perform several workflow modeling and analysis assignments.

A high-level overview of the theoretical part of the course:

- › Business Process Management
  - › Short overview of business processes and the need to manage them.
  - › Describing business processes, modeling the control flow, data and resource perspectives.
  - › Analysis of business processes, qualitatively and quantitatively.
  - › Redesign of business processes.
  - › Mining Process Logs.
- › Data Science Workflows
  - › Short overview of data science workflows.
  - › Describing workflows in data science.
  - › Analysis and optimization of data science workflows.
  - › Data privacy.
  - › Explainability of data science workflows.
  - › Bias and fairness in data science workflows.

## Objectives (and/or specific learning outcomes)

At the end of the course students are able to:

- › Explain the business process management cycle.
- › Design a formal model of the business process based on an informal description.
- › Identify opportunities for optimizing business processes.
- › Describe data science workflows.
- › Identify the costs associated with executing data science workflows.
- › Optimize data science workflows.
- › Identify concerns about data privacy and bias.
- › Propose techniques to increase the explainability of data science workflows.

## Teaching method and learning activities

- › Theory lectures (24h).
- › Exercises; both pen-and-paper and practical exercises (24h).
- › Four assignments to be realized in groups (12h).
- › Final Exam.

## References, bibliography and recommended reading

Course book (available through Cible+):

- › Dumas, La Rosa, Mendling & Reijers: Fundamentals of Business Process Management (second edition), Springer 2018

## Course notes

Université virtuelle

## Other information

### Place(s) of teaching

Solbosch

### Contact(s)

Prof. Dimitris Sacharidis <dimitris.sacharidis@ulb.be>

## Evaluation method(s)

written examination and Practice work

## written examination

Closed question with multiple choices (MCQ), Closed question with Multiple Answers (MAQ) and Closed question True or False (T/F)

Open book examination

## Determination of the mark (including the weighting of partial marks)

- > Four assignments (60%).
- > Final Exam (40%).

## Main language(s) of evaluation

English

## Programmes

### Programmes proposing this course at the Brussels School of Engineering

MA-IREM | **Master of science in Electromechanical Engineering** | finalité Operations engineering and management/unit 1 and MA-IRIF | **Master of science in Computer Science and Engineering** | finalité Professional/unit 1, finalité Professional/unit 2 and finalité Big Data Management and Analytics (Erasmus Mundus)/unit 1

### Programmes proposing this course at the faculty of Sciences

MA-INFO | **Master in Computer science** | finalité Professional/unit 2 and MA-SECU | **Master in cybersecurity** | finalité Erasmus Mundus joint master in Cybersecurity (CYBERUS)/unit 2

