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