MGT-415

Data science in practice

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Cursus	Sem.	Type
Management, Technology and Entrepreneurship minor	E	Opt.
Managmt, tech et entr.	MA2, MA4	Opt.

Language of teaching	English
Credits	2
Session	Summer
Semester	Spring
Exam	During the semester
Workload	60h
Weeks	14
Hours	**2 weekly**
Courses	1.5 weekly
Number of positions	

Remark

Special schedule. See the MTE website: http://cdm.epfl.ch/mte/study-plan

Summary

The goal of the course is to introduce students to the main business areas where analytics is used in business. The course is based on use-cases from the financial industry and is meant to give a hands-on experience to students in various domains such as Marketing, Sales, HR, IT, or Compliance.

Content

The different chapters covered in the scope of this course (may be subject to change):

- General overview/concepts of Analytics in Business
- Customer Analytics
- Wealth Management
- Web Analytics
- Compliance/Fraud Analytics
- Risk Analytics
- HR Analytics

Keywords

- Data Science
- Statistics
- Data Analysis

Learning Prerequisites

Important concepts to start the course

- Basic Probability & Statistics
- Machine Learning concepts
- Knowledge of R and/or Python

Learning Outcomes

By the end of the course, the student must be able to:

- Develop a methodology tailored to the problem
- Assess / Evaluate the chosen methodology and approach
- Use programming skills for a given problem
- Identify the adequate analytical methodology to tackle a problem
- Present findings from the analysis
- Formulate a business problem in terms of an analytical one

Transversal skills

- Demonstrate a capacity for creativity.
- Use both general and domain specific IT resources and tools
- Access and evaluate appropriate sources of information.
- Assess progress against the plan, and adapt the plan as appropriate.
- Use a work methodology appropriate to the task.
- Communicate effectively with professionals from other disciplines.
- Demonstrate the capacity for critical thinking

Teaching methods

- First part of the course is dedicated to theoretical concepts, discussion of different use-cases
- Second part of the course consists in applying the knowledge to various problems and datasets using R or Python

Expected student activities

- Attendance and participation in lectures and exercise sessions
- Interactions during class

Assessment methods

- Group Project (50%)
- Written exam (50%)

Supervision

Office hours	No
Assistants	No
Forum	No

Resources

Virtual desktop infrastructure (VDI)

Yes

Bibliography

- The elements of Statistical Learning (Hastie, Tibshirani, Friedman)
- Pattern Recognition and Machine Learning (Bishop)
- Data Science from Scratch (Guru)
- Web Scraping with Python (Lawson)
- Fraud Analytics Using Descriptive, Predictive, and Social Network Techniques: A Guide to Data Science for Fraud Detection (Baesens, Van Vlasselaer, Verbeke)
- Python Machine Learning (Raschka)
- Data Science for Business (Provost, Fawcett)

Ressources en bibliothèque

- The elements of Statistical Learning / Hastie, Tibshirani, Friedman
- Pattern recognition and machine learning / Bishop
- Data Science from Scratch / Grus
- Web Scraping with Python / Lawson
- Fraud Analytics Using Descriptive, Predictive, and Social Network Techniques: A Guide to Data Science for Fraud Detection / Baesens
- Python Machine Learning / Raschka
- Data Science for Business / Provost