Lisbon School of Economics & Management
Universidade de Lisboa

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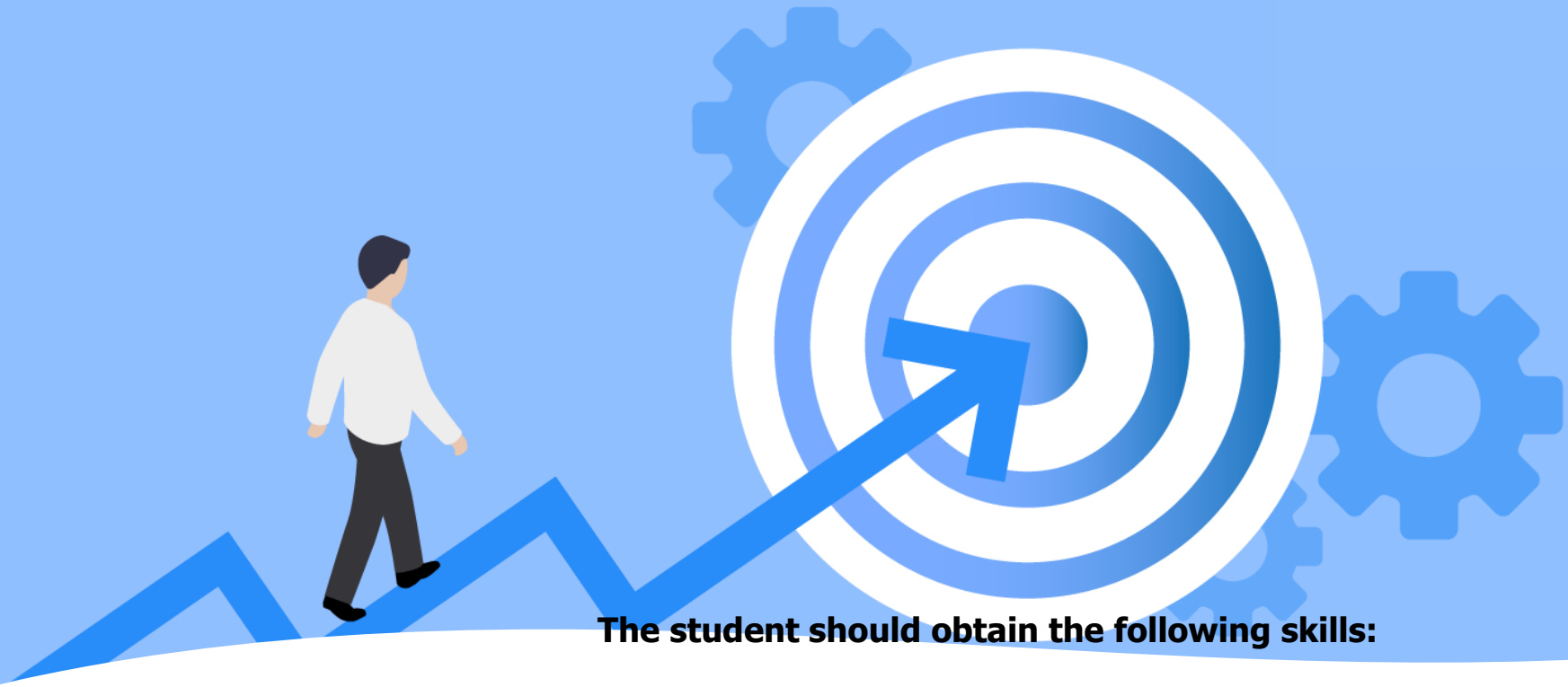
UNIVERSIDADE DE LISBOA

BIG DATA ANALYTICS

Academic Year: 2025/2026

Introduction

- Learning Objectives
- Program
- Bibliography
- Evaluation rules
- Professor



Course Objectives

The student should obtain the following skills:

- **LO1 Understanding of Big Data:** Understands concepts, characteristics, and technologies of big data.
- **LO2 Data Collection and Management**: Evaluates methods and ethical practices in data collection.
- **LO3 Analytical Techniques:** Applies data mining and machine learning for sustainable analysis.
- **LO4 Processing Frameworks**: Explains frameworks for real-time and batch processing.
- **LO5 Case Analysis**: Evaluates big data case studies in sustainability and extracts lessons learned.
- **LO6 Future Trends**: Explores emerging big data technologies and their sustainable applications.

Course Syllabus

- **Session 1: Introduction to Big Data**
  • Definition and characteristics of big data (volume, velocity, variety, veracity, value).
  • Importance in the business environment and sustainability.
  • Technologies in big data analysis (Hadoop, Spark, NoSQL).
- **Session 2: Data Collection and Management**
  • Methods of data collection (surveys, web scraping, sensors).
  • Storage of structured and unstructured data.
  • Governance and ethical practices, focusing on environmental impact.
- **Session 3: Analytical Techniques**
  • Data mining and machine learning.
  • Predictive analytics for industries and sustainability.
- **Session 4: Big Data Processing**
  • Processing frameworks (MapReduce, Apache Spark).
  • Batch vs. real-time processing and applications in sustainability.
- **Session 5: Case Studies**
  • Successful big data use cases in sustainability (energy efficiency, waste reduction).
- **Session 6: Future Trends**
  • Emerging technologies (AI, IoT, blockchain).
  • Big data's role in the future of sustainable business practices.

Bibliography

Furht, B., & Villanustre, F. (2016). Big data technologies and applications. Springer.

Provost, F., & Fawcett, T. (2013). *Data Science for Business: What You Need to Know about Data Mining and Data-Analytic Thinking*. O'Reilly Media.

Marr, B. (2016). *Big Data in Practice: How 45 Successful Companies Used Big Data Analytics to Deliver Extraordinary Results*. Wiley.

Zikopoulos, P., Eaton, C., DeRoos, D., Deutsch, T., & Lapis, G. (2012). *Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data*. McGraw-Hill.

Ghavami, P. (2019). *Big data analytics methods: analytics techniques in data mining, deep learning and natural language processing*. Walter de Gruyter GmbH & Co KG.

Main sources:

- **Slices and document in fenix**
- **https://www.databricks.com/**

Accessment

- **Exam**: 50%
- **Classes**: 10%
- **Group Project** : 40%

Deadlines

(May be subject to change: Confirm in the worksheet)

Class Participation (10%): Based on engagement in class discussions and hands-on labs.
Group Project (40%): Teams will be assigned a Big Data problem to solve using analytics tools. They must present their findings and recommendations.
Final Exam (50%): A combination of theoretical and practical questions assessing students' understanding of the topics covered in class.

What I expect from students

- Classes must be complemented with individual study hours.
- Act with ethics towards work and others.
- Learn and participate in class activities with enthusiasm
- Be respectful
  - *listen | share airtime |open mind |use of personal devices only when required or during breaks*
- Be Responsible:
  - *Arrive on time | follow class activities | help others (but do not do their work) | integrate your colleagues in the group work*
- Be a problem solver
  - *ask questions | Share ideas |embrace the struggle of learning | Stay positive!*

AI Support

- You have many tools that may be used (Chat-GPT, gemini.google.com, scispace.com, ...)
- But must be used ethically

- Use to learn
- Evaluate

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