TEACHING GUIDE - 2026-2027

Artificial Intelligence & Machine Learning

UGRA_000563

Departments	Data, Analytics, Technology and Artificial Intelligence (DATA), Dept. of Operations, Innovation & Data Sciences
Teaching Languages	English
ECTS	4
Teacher responsible	Marc Torrens Arnal - marc.torrens@esade.edu

Course Goals

At the end of the course, students should:

- Understand the current and future impact of AI in our society and businesses.
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- Be able to identify AI-based opportunities within organizations. This implies to identify (big) data value and know how to apply AI to create new business models with innovative products and services.
- Understand the different available AI technologies and how to apply them in different contexts.
- Be acknowledgeable on available platforms and tools to successfully apply AI in companies.
- Know how to build AI prototypes based existing platforms such as BigML to validate ideas.
- Have the necessary skillset to lead and manage company transformations based on AI technologies.
- Be able to have an informed discussion about any general topic involving AI technologies including ethics, legislation, education and employment.

Previous knowledge

Basic Python programming skills are required.

Teaching methodology

This course is given as a mix of theory lecutres, discussions on business cases, and prototyping AI systems. The discussions on business cases will be prepared before the class and they support the lectures. Then, students will prototype AI systems in order to deeply understand the concepts taught in lectures.

Prototyping will be done with real data on cases. We will use ML tools to explore and analyse data, build models, and make predictions.

Description

Short description

Artificial Intelligence (AI) is transforming our society in a new and unprecedented industrial revolution. AI is impacting organisations at their core, reshaping business models and enriching people's daily lives. This course provides an overview of AI technologies, and explains how they can be used in practice. Specific focus will be given to Machine Learning (ML) and Recommender Systems that are being successfully applied to disrupt many industries. This course is designed to acquire a deep understanding of the main AI techniques from a business point of view.

The course uses a mix of engaging lectures and hands-on activities on practical business cases. This course also involves using ML tools to prototype real cases. At the end of the course, students will be able to understand AI main technologies, identify business opportunities based on ML and Recommender Systems, and prototype real business cases.

Activities

Case study resolution
Several real business cases resolution with data and ML.

Content

#	Topic
1	AN INTRODUCTION TO ARTIFICIAL INTELLIGENCE This introductory session gives the basic concepts of AI and guides you through its evolution to understand how it is applied to transform industries and businesses. • What is Artificial Intelligence (AI)? • The AI evolution and its future • Artificial General Intelligence versus Applied AI • The impact of AI in businesses • The impact of AI in society • Examples of AI systems used in our daily lives
2	MACHINE LEARNING LIFE CYCLE Machine Learning (ML) is the most successfully applied AI technolgogy nowadays. ML is about analysing large data sets to discover knowledge and insights on organizations and customers. Those insights are encoded into models that are capable of predicting outcomes from data. • Machine Learning Introduction • The Machine Learning Life Cycle • Supervised and Unsupervised Learning Algorithms • Practical example using BigML
3	Supervised Learning; Classification models
4	Supervised learning: Regression
5	Unsupervised Learning: Clustering
6	RECOMMENDER SYSTEMS Recommender Systems are boradly used in many industries. Companies such as Netflix, Amazon, Spotify and Facebook have built their core business around

#	Topic
6	Recommendation and Personalization technologies. • Why do we need Recommender Systems? • What is a Recommender System? • Collaborative-based Filtering • Examples
7	Prototyping with ML

Assessment

Tool	Assessment tool	Category	Weight %
Attendance and punctuality	Attendance and Attitude	Retake and ordinary round	10.00%
Written and/or oral exams	Individual Exam	Retake and ordinary round	30.00%
Group project	Final Project	Retake and ordinary round	30.00%
Individual or team exercises	Individual Assgnments	Retake and ordinary round	30.00%

PROGRAMS

BBA20-Bachelor of Business Administration (BBA) (Undergraduates: Business)
- BBA20 Year 3 (Optative)
- BBA20 Year 4 (Optative)

BBA23-Bachelor of Business Administration (BBA) (Undergraduates: Business)
- BBA23 Year 3 (Optative)
- BBA23 Year 4 (Optative)

BBA25-Bachelor of Business Administration (BBA) (Undergraduates: Business)
- BBA25 Year 1 (Optative)
- BBA25 Year 3 (Optative)

TUM23-TUM Entrepreneurship Exchange Programme (Undergraduates: Business)
- TUM23 Year 1 (Optative)