UAB
Universitat Autònoma de Barcelona

Machine Learning 2

Code: 104871
ECTS Credits: 6

2024/2025

Degree	Type	Year
2503852 Applied Statistics	OB	3

Contact

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Teachers

Roger Borràs Amoraga

Teaching groups languages

You can view this information at the end of this document.

Prerequisites

The first year subjects, in addition to Numerical Methods and Optimization and Machine Learning 1.

Objectives and Contextualisation

To learn at theoretical and practical levels the potential of deep learning for structured and also unstructured data.

Learning Outcomes

1. CM11 (Competence) Create new machine learning models, running experiments to demonstrate their feasibility and improved performance compared to the state of the art.
2. CM12 (Competence) Assess the existence of inequalities on the grounds of gender in databases, to avoid bias in automatic (algorithmic) decision-making.
3. KM16 (Knowledge) Recognise supervised and unsupervised, profound and generic machine learning models, fostering innovation in the field of statistics.
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Content

Topic 1: Fully connected neural networks.
Topic 2: Convolutional neural networks.
Topic 3: Recurrent neural networks.
Topic 4: Other types of neural networks.

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Lab sessions	30	1.2	
Type: Supervised			
Theory sessions	50	2	
Type: Autonomous			
Personal study of the subject	46	1.84	

Teaching will combine classroom lessons by teachers and practical work for students with a computer.

In all aspects of teaching/learning activities, the best efforts will be made by teachers and students to avoid language and situations that can be interpreted as sexist.

To achieve continuous improvement in this subject, everyone should collaborate in highlighting them.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Assessment

Continous Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Exam	50%	4	0.16	CM11, CM12, KM16
Practical Project	50%	20	0.8	CM11, CM12, KM16

Continuous grading

The grading for the course will be done in two parts: the theory part, NT, and the practice part, NP. The final grade for the course will be N = 0.5*NT + 0.5*NP.

The grading for the theory part will be based in two exams: a partial exam, NEP, and a final exam, NEF. The final grade for the theory part will be NT = max(NEF, 0.3*NEP + 0.7*NEF), as long as NEF is higher than 3,5, otherwise NT = NEF.

The grading for the practice part will have be based on deliverables during the course.

On the day of the second-chance exam only the grade for the theory part will be updated. If a student goes to the second-chance exam then the theory grade, NT, will be NT = min(5, NER), where NER is the grade for the second-chance exam.

In order for an activity to be taken into account in the final grade, the activity grade has to be a minimum of 3,5. If NT or NP are below 3,5, then the final grade for the course will be N = min(NT, NP).

The student who has submitted works for at least 50% of the subject will be considered evaluable. Otherwise, it will appear in the record as non-evaluable.

Single grading

The grading for a student who chooses to be evaluated with the single grading modality will be based on the final examn grade (50%) and the grade for a practical project (50%).

Bibliography

- Prince, S. (2023) Understanding Deep Learning
- Geron, A. (2019) Hands-on Machine Learning with Scikit-Learn, Keras, and TensorFlow (O'Reilly)
- Goodfellow, I. et al (2016) Deep Learning (MIT Press)
- Chollet, F. (2017) Deep Learning with Python (Manning)

Software

Python

Language list

Name	Group	Language	Semester	Turn
(PLAB) Practical laboratories	1	Catalan	second semester	afternoon
(TE) Theory	1	Catalan	second semester	afternoon