

## [MNA102] Machine Learning

### GENERAL INFORMATION

<b>Studies</b>	MASTER DEGREE IN DATA ANALYSIS, CYBERSECURITY AND CLOUD COMPUTING	<b>Subject</b>	Data Analysis
<b>Semester</b>	1	<b>Course</b>	1
<b>Character</b>	COMPULSORY	<b>Mention / Field of specialisation</b>	
<b>Plan</b>	2024	<b>Modality</b>	Face-to-face
<b>Credits</b>	3	<b>Hours/week</b>	0
		<b>Language</b>	ENGLISH
		<b>Total hours</b>	32 class hours + 43 non-class hours = <b>75 total hours</b>

### PROFESSORS

IZAGIRRE AIZPITARTE, UNAI

### REQUIRED PREVIOUS KNOWLEDGE

Subjects	Knowledge
<i>(No specific previous subjects required)</i>	<i>(No previous knowledge required)</i>

### LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
<b>M2N102</b> - Designing, developing and implementing pre-processing and data modelling techniques to predict, classify and group them, being able to interpret and validate the models created for the extraction of knowledge		x		2,4
<b>M2N209</b> - Communicate their conclusions and the ultimate knowledge and reasons behind them to specialist and non-specialist audiences in a clear and unambiguous way.		x		0,6
<b>Total:</b>				<b>3</b>

*KC: Knowledge or Content / SK: Skills / AB: Abilities*

### SECONDARY LEARNING RESULTS

**RA121** Recognizes and uses machine learning concepts to apply them in data preprocessing.

#### LEARNING ACTIVITIES

	CH	NCH	TH
Development and writing of records, reports, presentations, audiovisual material, etc. on projects/work experience/challenges/case studies/experimental investigations carried out individually and/or in teams	2 h.	3 h.	5 h.
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints	1 h.	3 h.	4 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	4,5 h.		4,5 h.
Carrying out exercises and solving problems individually and/or in teams	2,5 h.	4 h.	6,5 h.

#### EVALUATION SYSTEM

	W
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	15%
Presentation and defence of exercises, case studies, computer practical work, simulation practical work, laboratory practical work, term projects, end of degree project, master's thesis, challenges and problems	25%
Individual written and/or oral tests or individual coding/programming tests	60%

#### MAKE-UP MECHANISMS

Individual written and/or oral tests or individual coding/programming tests

**CH - Class hours:** 10 h.

**NCH - Non-class hours:** 10 h.

**TH - Total hours:** 20 h.

**RA122** Develops and proposes solutions, individually and in groups, based on data analysis using machine learning concepts.

#### LEARNING ACTIVITIES

	CH	NCH	TH
Development and writing of records, reports, presentations, audiovisual material, etc. on	6 h.	16 h.	22 h.

projects/work experience/challenges/case studies/experimental investigations carried out individually and/or in teams			
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints	1 h.	3 h.	4 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	8,5 h.		8,5 h.
Carrying out exercises and solving problems individually and/or in teams	6,5 h.	14 h.	20,5 h.
<b>EVALUATION SYSTEM</b>	<b>W</b>	<b>MAKE-UP MECHANISMS</b>	
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	15%	Individual written and/or oral tests or individual coding/programming tests	
Presentation and defence of exercises, case studies, computer practical work, simulation practical work, laboratory practical work, term projects, end of degree project, master's thesis, challenges and problems	25%		
Individual written and/or oral tests or individual coding/programming tests	60%		
<b>CH - Class hours: 22 h.</b>			
<b>NCH - Non-class hours: 33 h.</b>			
<b>TH - Total hours: 55 h.</b>			

## CONTENTS

1. Data preprocessing
  - 1.1 Cleaning
  - 1.2. Transformations
  - 1.3. Lost values and extraordinary values
  - 1.4. Selection/extraction/discrediting of variables
2. Data analysis and training of traditional ML models
  - 2.1. Types of problems: classification, regression, grouping
  - 2.2. Families of models
  - 2.3. Selection of models
  - 2.4. Model valuation

## LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources	Bibliography
Subject notes	<a href="http://katalogoa.mondragon.edu/janium-bin/janium_login_opac_re_in_k.pl?grupo=MASTERDATUANALISIA11&amp;ejecuta=10&amp;">http://katalogoa.mondragon.edu/janium-bin/janium_login_opac_re_in_k.pl?grupo=MASTERDATUANALISIA11&amp;ejecuta=10&amp;</a>
Technical articles	
Presentations by external Lecturers	
Moodle Platform	
Computer practical training	
Class presentations	