

[MNA005] ADVANCED MACHINE LEARNING

GENERAL INFORMATION

Studies	MASTER DEGREE IN DATA ANALYSIS, CYBERSECURITY AND CLOUD COMPUTING		Subject	Data Analysis
Semester	2	Course	1	Mention / Field of specialisation
Character	COMPULSORY		Language	ENGLISH
Plan	2019	Modality	Adapted Face-to-face	Total hours
Credits	3	Hours/week	0	32 class hours + 43 non-class hours = 75 total hours

PROFESSORS

ZUGASTI URIGUEN, EKHI

REQUIRED PREVIOUS KNOWLEDGE

Subjects	Knowledge
(No specific previous subjects required)	(No previous knowledge required)

SKILLS

VERIFICA SKILLS

SPECIFIC

MNCE04 - Designing, developing and implementing an advanced data analysis process to respond to the nature of the data and the objective of the task to be executed.

GENERAL

MNCG01 - Using computer tools of data analysis in new fields of application to solve complex problems and carry out engineering projects while considering the business and industrial context.

CROSS

MNCTR1 - Ability to work in multidisciplinary teams and in a multilingual environment (Basque/Spanish/English) and to communicate, both orally and in writing, knowledge, procedures, results and ideas related to the life cycle of the data, cybersecurity, and development and operations.

BASIC

M_CB7 - To know how to apply the acquired knowledge and competencies and the ability to solve problems in new or unfamiliar contexts within wider (or multidisciplinary) environments related to their field of study

LEARNING RESULTS

RA141 The student identifies the concepts of advanced pre-processing and data analysis

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	3 h.	8 h.	11 h.
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints	1 h.	2 h.	3 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	4 h.		4 h.
Carrying out exercises and solving problems individually and/or in teams	5 h.	7 h.	12 h.

EVALUATION SYSTEM

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

W

100%

MAKE-UP MECHANISMS

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

CH - Class hours: 13 h.

NCH - Non-class hours: 17 h.

TH - Total hours: 30 h.

RA142 The student proposes and develops data analysis oriented solutions, individually and in groups, using the concepts of advanced machine learning

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		5 h.	11 h.	16 h.
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints		1 h.	4 h.	5 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects		9 h.		9 h.
Carrying out exercises and solving problems individually and/or in teams		4 h.	11 h.	15 h.
EVALUATION SYSTEM		W	MAKE-UP MECHANISMS	
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems		40%	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		40%		
Individual written and/or oral tests or individual coding/programming tests		20%		
CH - Class hours: 19 h. NCH - Non-class hours: 26 h. TH - Total hours: 45 h.				

CONTENTS

- Introduction
- Deep Neural Networks
- DNNs building and tuning
- Applications of DNNs

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources	Bibliography
Subject notes	http://katalogoa.mondragon.edu/janium-bin/janium_login_opac_re_in_k.pl?grupo=MASTERDATUANALISIA12&ejecuta=10&
Technical articles	