[MSB102] DATA ANALYTICS AND FUNDAMENTALS OF MACHINE LEARNING

GENERAL INFORMATION

Studies	MASTER DEGREE IN SMART ENERGY SYSTEMS			**Subject**	?
Semester	1	**Course**	1	**Mention / Field of specialisation**	
Character	COMPULSORY				
Plan	2025	**Modality**	Face-to-face	**Language**	EUSKARA/CASTELLANO
Credits	4,5	**Hours/week**	0	**Total hours**	75.5 class hours + 37 non-class hours = **112.5 total hours**

2030 AGENDA GOALS

PROFESSORS

AGUIRRE ORTUZAR, AITOR

REQUIRED PREVIOUS KNOWLEDGE

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

LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
MS061 - Recognise and use machine learning concepts to apply them in data modelling to predict, classify and cluster data	x			4,04
MS171 - Ability to work in multidisciplinary teams and in a multilingual environment	x		x	0,16
MS222 - Exhibits, argues and defends the results obtained in the work carried out before a panel of judges			x	0,14
MS251 - Develops a project in the field of energy systems in a practical application context		x		0,16
			Total:	4,5

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

SECONDARY LEARNING RESULTS

RMS222 **[!]** ***Expone, argumenta y defiende ante un tribunal los resultados obtenidos en el trabajo desarrollado***

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	3,5 h.		3,5 h.

EVALUATION SYSTEM	W
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	100%

MAKE-UP MECHANISMS

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

CH - Class hours: 3,5 h.
NCH - Non-class hours: 0 h.
TH - Total hours: 3,5 h.

RMS112 **[!]** ***Reconocer y utilizar conceptos del aprendizaje automático para aplicarlos en el modelado de datos para predecir, clasificar y agrupar los mismos***

LEARNING ACTIVITIES	CH	NCH	TH
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints	9 h.		9 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	35 h.	19 h.	54 h.
Carrying out exercises and solving problems individually and/or in teams	20 h.	18 h.	38 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	33%	Individual written and/or oral tests or individual coding/programming tests
Individual written and/or oral tests or individual coding/programming tests	67%	

CH - Class hours: 64 h.
NCH - Non-class hours: 37 h.
TH - Total hours: 101 h.

RMS251 **[!]** ***Desarrolla un proyecto del ámbito de los sistemas energéticos en un contexto de aplicación práctica***

LEARNING ACTIVITIES	CH	NCH	TH
Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams	4 h.		4 h.

EVALUATION SYSTEM	W	MAKE-UP MECHANISMS
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	50%	Individual written and/or oral tests or individual coding/programming tests
Individual written and/or oral tests or individual coding/programming tests	50%	

CH - Class hours: 4 h.
NCH - Non-class hours: 0 h.
TH - Total hours: 4 h.

RMS171 **[!]** ***Es capaz de trabajar en equipos multidisciplinares y en un entorno multilingüe***

LEARNING ACTIVITIES	CH	NCH	TH
Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams	4 h.		4 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	100%	Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems

CH - Class hours: 4 h.
NCH - Non-class hours: 0 h.
TH - Total hours: 4 h.

CONTENTS

- Introduction- Exploratory analysis- Statistical bases- Pandas + numpyData pre-processing- Fundamentals for model validation- Supervised learning- Classification

- Regression

- Unsupervised learning

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources	Bibliography
Moodle Platform	Acceso online a bibliografía: https://labur.eus/ReBm1
Class presentations	
Computer practical training	
Specific Master Software	
Slides of the subject	