

[MSG001] Quantitative research methods

GENERAL INFORMATION

Studies	MASTER DEGREE IN SMART ENERGY SYSTEMS	Subject	Methodological Research Foundations
Semester	1	Course	2
Character	OPTIONAL	Mention / Field of specialisation	???
Plan	2022	Modality	Face-to-face
Credits	3	Hours/week	0
		Language	CASTELLANO
		Total hours	18 class hours + 57 non-class hours = 75 total hours

PROFESSORS

(No professor appointed)

REQUIRED PREVIOUS KNOWLEDGE

Subjects	Knowledge
(No specific previous subjects required)	[!] <i>Conocimientos básicos de Matlab</i>

LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
MSRA19 - To demonstrate capacity for the management of technological Research, Development and Innovation		x		1,5
MSR125 - To have and understand knowledge which provides a base or opportunity to be original in the development and/or application of ideas, often in an investigation context	x	x		1,5
Total:				3

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

SECONDARY LEARNING RESULTS

RSM001 [!] *Demostrar capacidad para la gestión de la Investigación, Desarrollo e Innovación tecnológica*

LEARNING ACTIVITIES

	CH	NCH	TH
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	7,5 h.		7,5 h.
Carrying out exercises and solving problems individually and/or in teams	1,5 h.	28,5 h.	30 h.

EVALUATION SYSTEM

W

Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems

Comments: At the end of each session, a work has to be delivered that has to meet some minimum requirements.

MAKE-UP MECHANISMS

(No mechanisms)

Comments: As long as the deadline allows, the final work can be corrected and resubmitted.

CH - Class hours: 9 h.

NCH - Non-class hours: 28,5 h.

TH - Total hours: 37,5 h.

RSM002 [!] *Poseer y comprender conocimientos que aporten una base u oportunidad de ser originales en el desarrollo y/o aplicación de ideas, a menudo en un contexto de investigación*

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CONTENTS

Data Analysis: Fitting and interpolation, two-dimensional and multi-dimensional.

Optimization: two-dimensional, multi-dimensional, restricted, unrestricted, linear, non-linear.

Dynamic systems 1: Resolution of ODEs, numerical and analytical.

Dynamic Systems 2: Dynamic Systems Simulation with Simulink.

Development of graphic interfaces with Matlab.

To be chosen by students: Artificial Neural Networks; Monte Carlo Methods or Dynamic Systems 3: PDEs

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources

Moodle Platform
Slides of the subject
Class presentations
Programmes

Bibliography

Manuales oficiales de Mathworks.
Mastering MATLAB 7, Duane C. Hanselman, Bruce L. Littlefield, Prentice Hall
Mastering SIMULINK, James B. Dabney, Thomas L. Harman, Prentice Hall
Métodos numéricos para ingeniero, Chapra, Steven C. and Canale, Raymond P., McGraw-Hill
An engineer's guide to MATLAB, Edward B. Magrab Shapour Azarm, Balakumar Balachandran, James Duncan, Keith Herold, Gregory Walsh, Prentice Hall, 2011
Applied numerical methods using MATLAB, Yang, W. Y.; Cao, W.; Chung, T.-S. & Morris, J, John Wiley & Sons, 2005