Goi Eskola Politeknikoa | Mondragon Unibertsitatea
Course: 2023 / 2024 - Course planning

[MDI301] QUANTITATIVE RESEARCH METHODS

GENERAL INFORMATION

Studies	UNIVERSITY MASTER IN STRATEGIC PRODUCT AND SERVICE DESIGN	**Subject**	INSTRUMENTAL AND NUMERIC TECHNIQUES
Semester 1	**Course** 2	**Mention / Field of specialisation**	???
Character OPTIONAL			
Plan 2022	**Modality** Face-to-face	**Language**	CASTELLANO
Credits 3	**Hours/week** 1	**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)	[!] *Conocimientos básicos de Matlab*

LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
MDRA19 - To demonstrate capacity for the management of technological Research, Development and Innovation		x		1,5
MDRB06 - 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

RMD302 [!] *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*

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	100%
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.

RMD303 [!] *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	100%
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MAKE-UP MECHANISMS

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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 Methos or Dynamic Systems 3: PDEs

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources	Bibliography
Moodle Platform	Manuales oficiales de Mathworks.
Slides of the subject	Mastering MATLAB 7, Duane C. Hanselman, Bruce L. Littlefi eld, Prentice Hall
Class presentations	
Programmes	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