[MHB204] QUANTITATIVE RESEARCH METHODS

GENERAL INFORMATION

Studies	UNIVERSITY MASTER IN INDUSTRIAL ENGINEERING			**Subject**	?
Semester	1	**Course**	2	**Mention / Field of specialisation**	???
Character	OPTIONAL				
Plan	2022	**Modality**	Face-to-face	**Language**	CASTELLANO
Credits	3	**Hours/week**	1.56	**Total hours**	28 class hours + 47 non-class hours = **75 total hours**

PROFESSORS

SOLER MALLOL, DANIEL

REQUIRED PREVIOUS KNOWLEDGE

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

LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
MHRA19 - Knowledge and skills for calculating and designing industrial constructions and structures.		x		1,5
MHR125 - Having and understanding knowledge providing a basis or opportunity to be original in developing and/or applying ideas, often in a research context.		x		1,5
			Total:	3

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

ENAEE LEARNING RESULTS	ECTS
ENA123 - Knowledge and comprehension: Deep knowledge and comprehension of mathematics and other basic sciences inherent in their engineering speciality, allowing them to achieve the other competencies of the degree.	0,75
ENA127 - Analysis in engineering: Ability to analyse new and complex engineering products, processes and systems within a broader multidisciplinary context; select and apply the most appropriate analysis, calculation and experimental methods already established, as well as innovative methods; and critically interpret the results of such analyses.	0,37
ENA130 - Analysis in engineering: Ability to identify, formulate and solve engineering problems in emerging areas of their speciality.	0,37
ENA132 - Engineering projects: Ability to project while applying the knowledge and cutting-edge understanding of their engineering speciality.	0,37
ENA134 - Research and innovation: Ability to carry out bibliographic searches and consult and use databases and other information sources with discretion, in order to carry out simulations with the aim of conducting research on complex topics of their speciality.	0,75
ENA139 - Practical application of engineering: Practical skills, such as the use of computer tools to solve complex problems, carry out complex engineering projects, and design and guide complex investigations.	0,37
Total:	3

SECONDARY LEARNING RESULTS

RAH201 **[!]** ***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	14 h.	23,5 h.	37,5 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

(No mechanisms)

CH - Class hours: 14 h.
NCH - Non-class hours: 23,5 h.
TH - Total hours: 37,5 h.

RAH202 **[!]** ***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	14 h.	23,5 h.	37,5 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

(No mechanisms)

CH - Class hours: 14 h.
NCH - Non-class hours: 23,5 h.
TH - Total hours: 37,5 h.

CONTENTS

Data analysis (8h): Fitting and interpolation, two-dimensional and multidimensional Optimization (4h): two-dimensional, multidimensional, constrained, unconstrained, linear, nonlinear Dynamical systems 1 (4h): EDO, numerically and analytically Dynamical systems 2 (4h): Simulation of dynamical systems with Simulink Neural networks (4h) User interfaces with Matlab (4h)

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources

- Moodle Platform
- Subject notes
- Programmes
- Class presentations

Bibliography

- Manuales oficiales de Mathworks
- Mastering MATLAB 7, Duane C. Hanselman, Bruce L. Littlefi eld, 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