[MHF201] MATERIAL FORMING

GENERAL INFORMATION

Studies	UNIVERSITY MASTER IN INDUSTRIAL ENGINEERING			**Subject**	?
Semester	1	**Course**	1	**Mention / Field of specialisation**	???
Character	OPTIONAL				
Plan	2022	**Modality**	Face-to-face	**Language**	ENGLISH
Credits	3	**Hours/week**	1.67	**Total hours**	30 class hours + 45 non-class hours = **75 total hours**

PROFESSORS

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REQUIRED PREVIOUS KNOWLEDGE

Subjects	Knowledge
[!] *Fundamentos de Procesos de Fabricación*	*(No previous knowledge required)*

LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
MHMP01 - To project, calculate and design integrated manufacturing systems, optimizing the most suitable manufacturing processes for different industrial sectors, based on their material and design, identifying the machinery to be used, the parameters to control and establishing the designs of the tools to be used.		x		0,6
MHMP02 - To project, calculate and design integrated manufacturing systems taking into account the performance of polymeric, metallic, composite and biomaterial materials and be able to establish the relationship between properties-microstructure-processing		x		0,6
MHRA27 - To demonstrate the ability to integrate knowledge and face the complexity of formulating judgments based on information that, being incomplete or limited, includes reflections on the social, health and safety, environmental, economic and industrial implications and responsibilities		x		0,6
MHR125 - To possess and understand knowledge that provides a basis or opportunity to be original in the development and/or application of ideas, often in a research context		x		0,4
MHR126 - To apply the knowledge acquired and your problem-solving skills in new, little-known or changing environments within broader (or multidisciplinary) contexts related to your area of study		x		0,4
MHR129 - To possess the learning skills that allow them to continue studying in a way that will be largely self-directed or autonomous		x		0,4
			Total:	3

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

ENAEE LEARNING RESULTS	ECTS
ENA124 - Knowledge and comprehension: Deep knowledge and comprehension of the engineering disciplines of their speciality, at the level necessary to acquire the rest of the competencies of the degree.	0,3
ENA128 - Analysis in engineering: Ability to conceive new products, processes, and systems.	0,36
ENA133 - Research and innovation: Ability to identify, find and obtain the required data.	0,3
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.	0,3
ENA136 - Research and innovation: High-level capacity and ability to project and carry out experimental investigations, interpret data with criteria, and draw conclusions.	0,18
ENA137 - Research and innovation: Ability to investigate the application of the most advanced technologies in their speciality.	0,36
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.	0,36
ENA140 - Practical application of engineering: Complete knowledge of application of materials, equipment and tools, engineering technology and processes, and their limitations.	0,48
ENA146 - Communication and Teamwork: Ability to employ different methods to communicate their conclusions, clearly and unambiguously, and the knowledge and logical foundations that support them, to audiences specialised and not specialised in the issue, in domestic and international contexts.	0,36
Total:	3

SECONDARY LEARNING RESULTS

RMH114 **[!]** ***Conoce los fundamentos tecnológicos de los procesos de conformado de chapa y es capaz de modelizar estos***

procesos mediante herramientas de modelización numérica

LEARNING ACTIVITIES	CH	NCH	TH
Computer simulation exercises, individually and/or in teams	10 h.	20 h.	30 h.

EVALUATION SYSTEM	W	MAKE-UP MECHANISMS
Individual written and/or oral tests or individual coding/programming tests	100%	*(No mechanisms)*

CH - Class hours: 10 h.
NCH - Non-class hours: 20 h.
TH - Total hours: 30 h.

RMH115 **[!]** ***Conoce las variables más importantes que definen los procesos de conformado de chapa y su efecto en la calidad final de los componentes***

LEARNING ACTIVITIES	CH	NCH	TH
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	20 h.	25 h.	45 h.

EVALUATION SYSTEM	W	MAKE-UP MECHANISMS
Individual written and/or oral tests or individual coding/programming tests	100%	Individual written and/or oral tests or individual coding/programming tests

CH - Class hours: 20 h.
NCH - Non-class hours: 25 h.
TH - Total hours: 45 h.

CONTENTS

1st MODULE. Introduction and industrial use of FEMSubject introductionWhy manufacturing process simulation?Importance of the virtual manufacturing

2nd MODULE. Virtual manufacturing techniquesHow to simulate the reality?Agreement between accuracy and computational timeNumerical simulation commercial codes

3th MODULE. Numerical methodsHow to solve the problem using a computer?Time discretizationSpatial discretization

4th MODULE. Material behaviorHow does the material behavior affect the result?Metal forming plasticity modelRelevant material parameters

5th MODULE. TribologyHow to simulate the contact between bodies?Contact algorithmsCharacterization methods

6th MODULE. Stamping softwareCommercial stamping softwareSimulation methodologyResults analysis

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources

Subject notes
Technical articles
Presentations by external Lecturers
Labs
Moodle Platform
Class presentations
Video projections
Computer practical training
Specific Master Software
Slides of the subject

Bibliography

Banabic, D. Sheet Metal Forming Processes. Constitutive Modelling and Numerical Simulation, Elsevier, 2010. ISBN 978-3-540-88112-4

Lange, K. Handbook of metal forming. McGraw-Hill Book Company, 1985. ISBN-10: 0872634574

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