SUBJECT TEACHING GUIDE

1107 - Experimental and Mathematical Methods for the Analysis of Combustion and Fire Dynamics
Master's Degree in Industrial Engineering Research

Academic year 2023-2024

1. IDENTIFYING DATA					
Degree	Master's Degree in Industrial Engineering Research			Type and Year	Optional. Year 1
Faculty	School of Industrial Engineering and Telecommunications				
Discipline	ADVANCES IN SECURITY AND RESOURCES ASSESSMENT IN INDUSTRY Module - Sustainable Design in Industrial Systems				
Course unit title and code	1107 - Experimental and Mathematical Methods for the Analysis of Combustion and Fire Dynamics				
Number of ECTS credits allocated	5	Term		Semester based (2)	
Web					
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. TRANSPORTES Y TECNOLOGIA DE PROYECTOS Y PROCESOS
Name of lecturer	MANUEL DANIEL ALVEAR PORTILLA
E-mail	daniel.alvear@unican.es
Office	E.T.S. de Ingenieros Industriales y de Telecomunicación. Planta: - 2. DESPACHO GIDAI S2041A (S2041A)
Other lecturers	MARIANO LAZARO URRUTIA

3.1 LEARNING OUTCOMES
- To facilitate the initiation in combustion and fire dunamics simulation avanced tools
- To create a proactive attitude toward the scientific studies in this area of knowledge to be developed both in academia and companies
- To be able to understand the fundamental phenomena and analysis methods of combustion process to face innovative solutions for the technological challenges
- To facilitate the improvement of collaborative capabilities to solve practical technical issues on combustion and fire safety engineering and the dissemination of that knowlegde

4. OBJECTIVES

to present the main mechanisms about combustion and enclousure fire dynamics
To establish the knowledge core on physical and mathematical modelling to analise fire dynamics
To use experimental combustion techniques and fire computater modeling to characterize this matter

6. COURSE ORGANIZATION

CONTENTS	
1	Introduction to combustion and fire dynamics
2	Experimental tests and methods
3	CFD Fire computer modelling
4	Solid phase degradation

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Simple exercises and questions to be solved in classroom.	Work	No	Yes	100,00
TOTAL				100,00

Observations

NOTE: GIVEN THE CURRENT UNCERTAIN HEALTH SITUATION, IN THE EVENT THAT THE COMPETENT HEALTH AND EDUCATION AUTHORITY DO NOT ALLOW ANY EVALUATION ACTIVITY TO BE CARRIED OUT IN PERSON IN THE CLASSROOM, A DISTANCE EVALUATION MODALITY WILL BE ADOPTED USING TELEMATIC MEANS.

Observations for part-time students

The evaluation methodology does not need from adaptations for part-time students.

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

Alvear, D.; Capote, J.; et al. Modelado y Simulación Computacional en la Edificación, Ediciones Díaz. 2006