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Training Activity: Modelling Workshop

ECTS: 3 ECTS

COORDINATOR: Luis López Bonilla

UNIVERSITY WHERE THE COORDINATOR IS: UC3M

HAVE YOU GIVEN PERMISSION TO RECORD YOUR CLASSES? No

LECTURER 1: Manuel Carretero

UNIVERSITY WHERE THE LECTURER 1 IS: UC3M

HAVE YOU GIVEN PERMISSION TO RECORD YOUR CLASSES? No

LECTURER 2: Filippo Terragni

UNIVERSITY WHERE THE LECTURER 2 IS: UC3M

HAVE YOU GIVEN PERMISSION TO RECORD YOUR CLASSES? No

LECTURER 3: María Higuera

UNIVERSITY WHERE THE LECTURER 2 IS: UPM

HAVE YOU GIVEN PERMISSION TO RECORD YOUR CLASSES? No

LECTURER 4: José Manuel Vega

UNIVERSITY WHERE THE LECTURER 2 IS: UPM

HAVE YOU GIVEN PERMISSION TO RECORD YOUR CLASSES? No

LECTURER 5: Fernando Varas

UNIVERSITY WHERE THE LECTURER 2 IS: UPM

HAVE YOU GIVEN PERMISSION TO RECORD YOUR CLASSES? No

SUBJECT CONTENTS

Propose and support simplified models for the analysis of relevant problems in industry.

Work plan programming in the framework of a R&D project and presentation to a potential client.

METHODOLOGY

The organization of the Modelling Workshop would be as follows:

(1) An initial face-to-face session (during the first three weeks of the teaching period, and using the video-conference system) where a professional from the industry, a technological centre or a university department proposes a real problem whose resolution involves developing a mathematical model.

(2) After the initial round of presentations, the students are divided in small groups (around four students each) and assigned one of these problems.

(3) During six weeks, the groups of students meet every one or two weeks with a lecturer who will help them to overcome the difficulties they may find developing the model and extracting useful information from it. These meetings

may be face-to-face or virtual, through video-voice chat software or the video-conference system.

(4) At the end of these regular meetings, the students prepare a report describing the conclusions of their work (posing a preliminary mathematical model and extracting sufficient information to defend its validity) and advance a work plan to develop a more complete study of the proposed real problem.

(5) In a final face-to-face session (during the last three weeks of the assigned teaching period), the students present their results to a professional from the industry, a technological centre or a university department. In this presentation, the students must answer the questions from the professional and support their proposal in a format as close as possible to the presentation of a R&D proposal to a client/ funding agency.

LANGUAGE USED IN CLASS:

It will be adapted taking into account both the speaker and the audience.

IS IT COMPULSORY TO ATTEND CLASS?

Yes. Using the video-conference system.

BIBLIOGRAPHY

SKILLS

Basic:

CG1: To have knowledge that provide a basis or opportunity for originality in developing and / or applying ideas, often within a research context, knowing how to translate industrial needs in terms of R & D in the field of mathematics Industrial.

CG2: To be able to apply the acquired knowledge and abilities to solve problems in new or unfamiliar environments within broader contexts, including the ability to integrate multidisciplinary R & D in the business environment.

CG3: To be able to integrate knowledge in order to state opinions using information that even incomplete or limited, include reflecting on social and ethical responsibilities linked to the application of their knowledge.

CG4: To have the ability to communicate the findings to specialist and non-specialist audiences in a clear and unambiguous way.

CG5: To have the appropriate learning skills to enable them to continue studying in a way that will be largely self-directed or autonomous, and also to be able to successfully undertake doctoral studies.

Specific:

CE2: To model specific ingredients and make appropriate simplifications in the model to facilitate their numerical treatment, maintaining the degree of accuracy, according to previous requirements.

CE3: To determine if a model of a process is well made and well mathematically formulated from a physical standpoint.

CE4: To be able to select a set of numerical techniques, languages and tools, appropriate to solve a mathematical model.

CE5: To be able to validate and interpret the results, comparing them with visualizations, experimental measurements and functional requirements of the physical engineering system.

WILL YOU BE USING A VIRTUAL PLATFORM?

No.

WILL YOU BE USING ANY SPECIFIC SOFTWARE?

No.

CRITERIA FOR THE 1ST ASSESSMENT OPPORTUNITY

Assessment will be based on the presentations by each group of students in the final sessions. In this assessment, the report, the oral presentation and the answers to the questions by the professional will be taken into account.

CRITERIA FOR THE 2ND ASSESSMENT OPPORTUNITY

Assessment will be based on the presentations by each group of students in the final sessions. In this assessment, the report, the oral presentation and the answers to the questions by the professional will be taken into account.