Fluid-thermal and Power MEMS

ECTS: 6 ECTS

COORDINATOR: Ángel Velázquez López (angel.velazquez@upm.es)

UNIVERSITY WHERE THE COORDINATOR IS: UPM

HAVE YOU GIVEN PERMISSION TO RECORD YOUR CLASSES? Yes

LECTURER 1: Juan Ramon Arias Pérez (juanramon.arias@upm.es)

UNIVERSITY WHERE THE LECTURER 1 IS: UPM

HAVE YOU GIVEN PERMISSION TO RECORD YOUR CLASSES? Yes

LECTURER 2: Antonio Barrero Gil (antonio.barrero@upm.es)

UNIVERSITY WHERE THE LECTURER 2 IS: UPM

HAVE YOU GIVEN PERMISSION TO RECORD YOUR CLASSES? Yes

SUBJECT CONTENTS: Fluid Mechanics, Heat Transfer and Energy Generation aspects of microsystems. Modeling, applications and resolution of specific practical cases.

METHODOLOGY: Lectures.

LANGUAGE USED IN CLASS: Will depend on the audience

IS IT COMPULSORY TO ATTEND CLASS? Students can attend via conference system

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BIBLIOGRAPHY

The MEMS Handbook. Mohamed Gag El Hak, CRC Press, 2005

Modeling NEMS and MEMS. Pelesko and Bernstein, Chapman & Hall, 2003

Theoretical Microfluidics. Bruus, Oxford University Press 2008

Encyclopeidia of Microfluidics and Nanofluidics, Dongquing Li, Springer 2008

Microfluidics technologies and Applications. Lin, Springer 2011

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.

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:

CE1: To acquire a basic knowledge in an area of Engineering / Applied Science, as a starting point for an adequate mathematical modelling, using well-established contexts or in new or unfamiliar environments within broader and multidisciplinary contexts.

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.

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

Modelling specialization:

CM2: To know how to model elements and complex systems leading to well-posed formulated problems.

WILL YOU BE USING A VIRTUAL PLATFORM? No.

WILL YOU BE USING ANY SPECIFIC SOFTWARE? No.

CRITERIA FOR THE 1ST ASSESSMENT OPPORTUNITY

Final project.

CRITERIA FOR THE 2ND ASSESSMENT OPPORTUNITY

Final project.
