

## Course guide

### 205096 - 205096 - Research in Fluid Mechanics

**Last modified:** 11/04/2025

**Unit in charge:** Terrassa School of Industrial, Aerospace and Audiovisual Engineering  
**Teaching unit:** 729 - MF - Department of Fluid Mechanics.

**Degree:** MASTER'S DEGREE IN INDUSTRIAL ENGINEERING (Syllabus 2013). (Optional subject).  
MASTER'S DEGREE IN AERONAUTICAL ENGINEERING (Syllabus 2014). (Optional subject).  
MASTER'S DEGREE IN SPACE AND AERONAUTICAL ENGINEERING (Syllabus 2016). (Optional subject).  
MASTER'S DEGREE IN INDUSTRIAL ENGINEERING (Syllabus 2025). (Optional subject).

**Academic year:** 2025 **ECTS Credits:** 3.0 **Languages:** English

#### LECTURER

**Coordinating lecturer:** Francisco Javier Arias Montenegro  
**Others:** Salvador Augusto De Las Heras Jimenez

#### TEACHING METHODOLOGY

The course is divided into:

1. Face-to-face activities. Lecture on selected topics in fluid mechanics. Theoretical subjects will be discussed by the students, with guidance from the professor. Brief presentations by students may occasionally be requested.
2. Autonomous work. Self-study, problem solving, lectures on several topics

#### LEARNING OBJECTIVES OF THE SUBJECT

Learning outcomes:

- Identify the research process broadly as all exploratory activity of which the purpose is to come to a better understanding of the natural world.
- Identify the main parts involved in the research methodology and with particular reference in fluid mechanics.
- Solve a real actual research problem either proposed by the student or the teacher related to fluid mechanics.
- To endow student with the capacity to carry out an original research idea from its inception with guidance from the teacher to the publication of results in a journal.

#### STUDY LOAD

| Type              | Hours | Percentage |
|-------------------|-------|------------|
| Hours large group | 19,0  | 25.33      |
| Self study        | 48,0  | 64.00      |
| Hours small group | 8,0   | 10.67      |

**Total learning time:** 75 h



## CONTENTS

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### Module 1: Research on Fluid Mechanics

**Description:**

1. Brief introduction to scientific method in scientific research on fluid mechanics
2. Tools in fluid mechanic's research: experimentation and computational simulation
3. Essential guidelines for computational method benchmarking
4. The publication of research results: How to write and publish a scientific paper.

**Full-or-part-time:** 75h

Theory classes: 27h

Self study : 48h

## GRADING SYSTEM

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The assessment of the learning process is based on the following activities each one having a given weight in the final grade as follows:

1. An article written by the student on an identified research topic on fluid mechanics. This article could be potentially submitted to a peer review in an indexed journal: 50%
2. Oral presentations of the work done: 25%
3. Short quizzes posed during class sessions can occasionally be used to define deliverables. 25%