



# Course guide

## 820463 - MHTM - Hydraulic and Thermal Machinery

Last modified: 27/05/2024

**Unit in charge:** Barcelona East School of Engineering  
**Teaching unit:** 729 - MF - Department of Fluid Mechanics.

**Degree:** **Academic year:** 2024 **ECTS Credits:** 6.0  
**Languages:** Catalan, Spanish

### LECTURER

**Coordinating lecturer:** CARLOS RUIZ MOYA

**Others:** Segon quadrimestre:  
ALFRED FONTANALS GARCIA - M10  
CARLOS RUIZ MOYA - M10

### DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

#### Specific:

1. Understand and apply the fundamentals of fluid mechanics systems and machines.
2. Understand the applications of thermal engineering.

#### Transversal:

3. SELF-DIRECTED LEARNING - Level 3. Applying the knowledge gained in completing a task according to its relevance and importance. Deciding how to carry out a task, the amount of time to be devoted to it and the most suitable information sources.

### TEACHING METHODOLOGY

### LEARNING OBJECTIVES OF THE SUBJECT

### STUDY LOAD

Type	Hours	Percentage
Hours large group	60,0	40.00
Self study	90,0	60.00

**Total learning time:** 150 h

### CONTENTS

#### (ENG) TEMA 1. GENERALITATS SOBRE TURBOMÀQUINES HIDRÀULIQUES

**Full-or-part-time:** 5h 20m  
Theory classes: 2h  
Self study : 3h 20m



**(ENG) TEMA 2. BOMBES ROTODINÀMIQUES**

**Full-or-part-time:** 15h 10m  
Theory classes: 6h  
Self study : 9h 10m

**(ENG) TEMA 3. VENTILADORS**

**Full-or-part-time:** 16h 50m  
Theory classes: 6h  
Self study : 10h 50m

**(ENG) TEMA 4. TURBINES HIDRÀULIQUES**

**Full-or-part-time:** 16h 50m  
Theory classes: 6h  
Self study : 10h 50m

**(ENG) TEMA 5. LLEIS DE SEMBLANÇA I CORBES CARACTERÍSTIQUES DE LES TMH**

**Full-or-part-time:** 15h 30m  
Theory classes: 5h  
Laboratory classes: 3h  
Self study : 7h 30m

**(ENG) TEMA 6. CENTRALS HIDRÀULIQUES**

**Full-or-part-time:** 6h 20m  
Theory classes: 3h  
Self study : 3h 20m

**(ENG) TEMA 7. AEROGENERADORS**

**Full-or-part-time:** 14h 30m  
Theory classes: 7h  
Self study : 7h 30m

**(ENG) TEMA 8. COMPRESSORS ALTERNATIUS**

**Full-or-part-time:** 14h 10m  
Theory classes: 5h  
Self study : 9h 10m



### (ENG) TEMA 9. TURBOCOMPRESSORS

**Full-or-part-time:** 12h 50m  
Theory classes: 4h 30m  
Self study : 8h 20m

### (ENG) TEMA 10. FLUX EN TURBOMÀQUINES HIDRÀULIQUES

**Full-or-part-time:** 32h 30m  
Theory classes: 8h  
Laboratory classes: 4h 30m  
Self study : 20h

## GRADING SYSTEM

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## BIBLIOGRAPHY

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### Basic:

- Agüera Soriano, José. Mecánica de fluidos incompresibles y turbomáquinas hidráulicas. 5ª ed. act. Madrid: Ciencia 3, DL 2002. ISBN 8495391015.
- Mataix, Claudio. Turbomáquinas hidráulicas : turbinas hidráulicas, bombas, ventiladores. Madrid: Editorial ICAI, 1975. ISBN 8460066622.
- Sistemas eólicos de producción de energía eléctrica. Alcorcón: Rueda, 2003. ISBN 8472071391.

### Complementary:

- Lakshminarayana, Budugur. Fluid dynamics and heat transfer of turbomachinery. New York [etc.]: John Wiley & Sons, cop. 1996. ISBN 0471855464.
- Dixon, S. L. Fluid mechanics and thermodynamics of turbomachinery [on line]. 6th ed. Amsterdam [etc.]: Elsevier : Butterworth-Heinemann, cop. 2010 [Consultation: 04/06/2020]. Available on: <https://www.sciencedirect.com/science/book/9781856177931>. ISBN 9781856177931.
- Schobeiri, Meinhard T. Turbomachinery flow physics and dynamic performance [on line]. 2nd ed. Heidelberg: Springer, cop. 2012 [Consultation: 04/06/2020]. Available on: <http://dx.doi.org/10.1007/978-3-642-24675-3>. ISBN 9783642246753.