



## Course guide

# 820427 - ETM - Thermal Engineering

Last modified: 29/06/2023

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

**Degree:** BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Compulsory subject).

**Academic year:** 2023    **ECTS Credits:** 6.0    **Languages:** Catalan, Spanish

### LECTURER

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**Coordinating lecturer:** JUAN GRAU BARCELÓ - ALFREDO DE JESUS GUARDO ZABALETA

Primer quadrimestre:

JUAN GRAU BARCELÓ - Grup: M11, Grup: M12, Grup: M13, Grup: M14, Grup: M15

ALFREDO DE JESUS GUARDO ZABALETA - Grup: T11, Grup: T12, Grup: T13, Grup: T14,  
Grup: T15

**Others:**

Primer quadrimestre:

JOSE ALEJANDRO CARRILLO CORTES - Grup: M15, Grup: T15

DAIBEL DE ARMAS ORAMAS - Grup: T11, Grup: T12, Grup: T13, Grup: T14

JUAN GRAU BARCELÓ - Grup: M11, Grup: M12, Grup: M13, Grup: M14, Grup: M15

ALFREDO DE JESUS GUARDO ZABALETA - Grup: T11, Grup: T12, Grup: T13, Grup: T14,  
Grup: T15

TÀNIA TORM OBRADORS - Grup: M11, Grup: M12, Grup: M13, Grup: M14

Segon quadrimestre:

JOSE ALEJANDRO CARRILLO CORTES - Grup: M13

JUAN GRAU BARCELÓ - Grup: M11, Grup: M12, Grup: M13, Grup: M14

ALFREDO DE JESUS GUARDO ZABALETA - Grup: T11, Grup: T12, Grup: T13

ALEJANDRO MARTINEZ ALEGRE - Grup: M14

REYNA MERCEDES PEÑA AGUILAR - Grup: T11, Grup: T12, Grup: T13

### DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

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**Specific:**

2. Understand the applications of thermal engineering.

**Transversal:**

3. SELF-DIRECTED LEARNING - Level 2: Completing set tasks based on the guidelines set by lecturers. Devoting the time needed to complete each task, including personal contributions and expanding on the recommended information sources.

### TEACHING METHODOLOGY

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### LEARNING OBJECTIVES OF THE SUBJECT

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## STUDY LOAD

Type	Hours	Percentage
Hours small group	15,0	10.00
Self study	90,0	60.00
Hours large group	45,0	30.00

**Total learning time:** 150 h

## CONTENTS

### (ENG) -1 Generació tèrmica. Generadors de vapor i calderes. Aprofitament de l'energia solar tèrmica

**Full-or-part-time:** 36h

Theory classes: 12h

Laboratory classes: 2h 30m

Self study : 21h 30m

### (ENG) -2: Equips de transferència de calor. Bescanviadors de calor. Torres de refrigeració. Psicrometria.

**Full-or-part-time:** 26h 30m

Theory classes: 6h

Laboratory classes: 4h 30m

Self study : 16h

### (ENG) -3: Cicles de potència de gas. Compressors alternatius i turbomàquines. Turbines de gas. Motors de combustió.

**Full-or-part-time:** 20h

Theory classes: 6h

Laboratory classes: 2h

Self study : 12h

### (ENG) -4: Cicles de potència de vapor. Turbines de vapor. Cogeneració.

**Full-or-part-time:** 25h

Theory classes: 6h

Laboratory classes: 4h

Self study : 15h

### (ENG) -5: Sistemes de refrigeració i bombes de calor.

**Full-or-part-time:** 20h

Theory classes: 6h

Laboratory classes: 2h

Self study : 12h



**(ENG) -6: Eficiència energètica. Recuperació de calor. Aïllament.**

**Full-or-part-time:** 22h 30m

Theory classes: 9h

Self study : 13h 30m

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## GRADING SYSTEM

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## BIBLIOGRAPHY

### Basic:

- Moran, Michael J.; Shapiro, Howard N. Fundamentos de termodinámica técnica. 2ª ed. Barcelona [etc.]: Reverté, cop. 2004. ISBN 8429143130.
- Çengel, Yunus A. Transferencia de calor y masa : un enfoque práctico. 3ª ed. México [etc.]: McGraw-Hill, cop. 2007. ISBN 9789701061732.
- Llorens, Martín; Miranda, Ángel Luis. Ingeniería térmica. Barcelona: Marcombo, cop. 2009. ISBN 9788426715319.

### Complementary:

- Çengel, Yunus A.; Boles, Michael A. Termodinámica. 8ª ed. México, D.F: McGraw-Hill Interamericana, cop. 2015. ISBN 9786071512819.
- Mills, Anthony F. Transferencia de calor. México DF [etc.]: Irwin, 1995. ISBN 8480861940.