Course guide
820427 - ETM - Thermal Engineering

Last modified: 04/06/2026

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: 2026 **ECTS Credits:** 6.0 **Languages:** Catalan, Spanish

LECTURER

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

Others:

Primer quadrimestre:
DAIBEL DE ARMAS ORAMAS - 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
ENRIQUE HURTÁN DÍAZ - Grup: M13, Grup: M14, Grup: T15
DAVID MARTÍN RIBES - Grup: M11, Grup: M12
PEDRO RUFES MARTINEZ - Grup: T11, Grup: T12

Segon quadrimestre:
DAIBEL DE ARMAS ORAMAS - Grup: T11, Grup: T12, Grup: T13
JUAN GRAU BARCELÓ - Grup: M11, Grup: M12, Grup: M13, Grup: M14
ALFREDO DE JESUS GUARDO ZABALETA - Grup: T11, Grup: T12, Grup: T13
DAVID MARTÍN RIBES - Grup: M11, Grup: M12
ROGER MAYNOU GIL - Grup: M13, Grup: M14

REQUIREMENTS

MECÀNICA DE FLUIDS - Prerequisit
TERMODINÀMICA I TRANSFERÈNCIA DE CALOR - Prerequisit

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

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

LEARNING OBJECTIVES OF THE SUBJECT

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

GRADING SYSTEM

Any academic fraud, plagiarism or use or possession of unauthorised means in an assessment activity leads to a mark of zero (0) for the affected test or assignment. Furthermore, in accordance with the University's regulations, if disciplinary proceedings are initiated the subject is recorded as "Pending Assessment" until a decision is reached. These incidents are managed in accordance with the **Action Framework for Academic Integrity in Assessment at the UPC**.

BIBLIOGRAPHY

Basic:
- Llorens, Martín; Miranda, Ángel Luis. Ingeniería térmica. Barcelona: Marcombo, cop. 2009. ISBN 9788426715319.
- 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.

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.