



Course guide

820427 - ETM - Thermal Engineering

Last modified: 27/02/2023

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: 2022 **ECTS Credits:** 6.0 **Languages:** Catalan, Spanish

LECTURER

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

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

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.

RESOURCES

Hyperlink:

- TEST, ¿The Expert System for Thermodynamics?. <http://www.thermofluids.net/>