

Información del Plan Docente

Academic Year	2017/18
Faculty / School	110 - Escuela de Ingeniería y Arquitectura
Degree	435 - Bachelor's Degree in Chemical Engineering
ECTS	6.0
Year	3
Semester	Second semester
Subject Type	Compulsory
Module	---

1.General information**1.1.Introduction****1.2.Recommendations to take this course****1.3.Context and importance of this course in the degree****1.4.Activities and key dates****2.Learning goals****2.1.Learning goals****2.2.Importance of learning goals****3.Aims of the course and competences****3.1.Aims of the course****3.2.Competences****4.Assessment (1st and 2nd call)****4.1.Assessment tasks (description of tasks, marking system and assessment criteria)****5.Methodology, learning tasks, syllabus and resources****5.1.Methodological overview**

The learning process for this subject is based on the following:

1. **Classes master** , taught the whole group, in which the teacher will explain the basic principles of the subject and resolve some representative problems of the application of realistic cases to future professional practice. The participation of students in this activity will be sought. In parallel, the student must perform work study for better utilization of classes.
2. **Trabajos tutorados** in small groups (couples ideally): students analyze and solve an issue of the subject. Independent learning and group work is enhanced.

29927 - Thermal Technics

3. **Tutorials** : the teacher will provide the student certain procedures for approach and resolving doubts. The use of these tutorials is highly recommended to ensure adequate progress in learning.

5.2.Learning tasks

The program to help achieve the expected results includes the following activities ...

The detailed program of the subject will be presented at the beginning of the course by the teacher. This program will cover both theoretical and practical aspects, on the following contents:

* Heat production. Basic chemistry. Combustion technology: boilers, furnaces. Combined heat and mass transfer: cooling towers, drying, etc. Heat transfer phase change: evaporators and condensers. Heat exchangers.

* Production work. Internal combustion reciprocating engines. Steam and gas turbines. Fuel cells. Compressors: reciprocating and rotary.

* Cold production. Vapour compression systems and vapour absorption cycles. Cryogenic cycles. Liquefaction of gases.

5.3.Syllabus

5.4.Course planning and calendar

Schedule sessions and presentation of works

Determined at the beginning of the academic year.

Resources

To facilitate and enhance communication between the student and the teacher, you can make available to students if the teacher deems it appropriate, Digital Teaching Platform Ring (ADD) of the University of Zaragoza. Here the teacher can distribute course materials (notes, questions, problems, exam type, tables, etc.), make announcements and notifications to students, send and receive e-mails and make available to students the tools for sending reports of learning activities.

5.5.Bibliography and recommended resources

BB	engel, Yunus A.. Termodinámica / Yunus A. Çengel, Michael A. Boles ; revisión técnica, Abraham Laurencio Martínez Bautista ... [et al.] . 8ª ed. Mexico [etc.] : McGraw-Hill Interamericana, D.L. 2015
BB	Çengel, Yunus A.. Transferencia de calor y masa : fundamentos y aplicaciones / Yunus A. Çengel;engel, Afshin J. Ghajar ; revisión técnica Rosario Dávalos Gutiérrez, Juan José Coble Castro, Sofía Faddeeva Sknarina, Álvaro Ochoa López . - 4ª ed. México D.F. : McGraw-Hill Interamericana, cop. 2011
BB	Moran, Michael J.. Fundamentos de termodinámica técnica / Michael J. Moran, Howard N. Shapiro . - 2ª ed. en español, reimp. Barcelona [etc.] : Reverté, D. L. 2011
BB	Winterbone, Desmond E.. Advanced thermodynamics for engineers / Desmond E. Winterbone . - [1st. publ.] London [etc.] : Arnold, cop. 1997

29927 - Thermal Technics

- BC** Giacosa, Dante. Motores endotérmicos : motores de encendido por chispa, de carburación y de inyección, motores de encendido por compresión Diesel, lentos y veloces, motores rotativos, turbinas de gas, teoría, construcción, pruebas / Dante Giacosa Barcelona : Omega, D.L.1988
- BC** Golden, Frederick M.. Termofluidos, turbomáquinas y máquinas térmicas / Frederick M. Golden, Luis Batres de la Vega, Guillermo Terrones . - 1a ed. Mexico : Compañía Editorial Continental, 1989
- BC** Muñoz Rodríguez, Mariano. Motores alternativos de combustión interna / Mariano Muñoz Rodríguez, Francisco Moreno Gómez, Jesús F. Morea Roy Zaragoza : Prensas Universitarias de Zaragoza, 1999
- BC** Turbomáquinas térmicas / Mariano Muñoz Rodríguez, Francisco J. Collado Giménez, Francisco Moreno Gómez, Jesús F. Morea Roy . - 1a ed. Zaragoza : Prensas Universitarias, 1999