

Academic Year: (2018 / 2019)

Review date: 05-06-2018

Department assigned to the subject: Thermal and Fluids Engineering Department

Coordinating teacher: SERRANO GARCIA, DANIEL

Type: Electives ECTS Credits : 3.0

Year : 4 Semester : 2

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Thermal Engineering
Heat Transfer

OBJECTIVES

The main goal of this subject is the design, calculation and selection of equipments in different energy systems.

The student will be able to:

- Set the operating conditions for cooling towers, evaporators, condensers and heat exchangers.
- Understand the relevant concepts on phase change processes and air-water non-reactive systems.
- Design heat exchangers that satisfy the desired operating conditions.
- Solve power plant cycles.

Specific abilities:

- Estimation of the operation for heat exchanger devices.
- Selection and design of different equipments in energy systems.

General abilities:

- Ability to solve problems
- Ability to search, communicate and discriminate what is the relevant information to characterize a heat exchanger equipment.
- The ability to apply knowledge of thermodynamics and heat and mass transfer to the resolution of certain problems on heat exchangers.
- The ability to teamwork and distribute the workload to face complex problems, mainly design.

Regarding attitudes, the student after completing the course should have:

- A critical attitude regarding the selection and design of the different heat exchanger devices that make up a process.
- An collaborative attitude to obtain the information and knowledge needed to perform complex tasks.

DESCRIPTION OF CONTENTS: PROGRAMME

This course is based on different heat exchanger devices and power plants. The program is divided in two parts:

FIRST PART: selection and design of heat exchangers:

- Natural cooling tower
- Mechanical air-cooled cooling tower
- Mechanical wet cooling tower
- Evaporative cooler/condenser

SECOND PART: power plant cycles:

- Brayton cycle
- Rankine cycle
- Combined cycle
- Heat recuperator steam generator

LEARNING ACTIVITIES AND METHODOLOGY

The teaching methodology will include:

- (1) Lectures, where the knowledge that students should acquire will be presented. To facilitate their development, students will receive class notes prior to the class for their reading and prior comprehension, as well as basic reference texts that will allow them to complete and deepen in those topics in which they are most interested.
- (2) Proposal typical problems to work in class and joint resolution during the class to obtain the specific abilities that the students must develop.

Sharing of the answers to the exercises and joint correction should serve to strengthen knowledge and develop the ability to analyze and communicate the relevant information for solving problems. In addition, the sharing will favor the exchange of critical opinions both between teacher and students and between students.

ASSESSMENT SYSTEM

- Continuous assesment
- 2 partial exams
- End-of-term exam

% end-of-term-examination:	60
% of continuous assessment (assigments, laboratory, practicals...):	40