Universidad Zaragoza

Academic Year/course: 2021/22

66342 - Advanced solar energy

Syllabus Information

Academic Year: 2021/22
Subject: 66342 - Advanced solar energy
Faculty / School: 110 - Escuela de Ingeniería y Arquitectura
Degree: 535 - Master's in Renewable Energies and Energy Efficiency
ECTS: 5.0
Year: 1
Semester: Second semester
Subject Type: Optional
Module:

1. General information

2. Learning goals

3. Assessment (1st and 2nd call)

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

The methodology followed in this course is oriented towards achievement of the learning objectives. It combines theoretical and practical activities, autonomous work and active group work.

4.2. Learning tasks

The course includes the following learning tasks:

- A01 Lectures (25 hours). Presentation of theoretical contents by a faculty or by external experts to all students enrolled in the course. Although it is not a mandatory activity, regular attendance is highly recommended.
- A02 Problem and case solving (13 hours). Solve practical problems and exercises with all the students. Although it is not a mandatory activity, regular attendance is highly recommended.
- A03 Laboratory sessions (12 hours). Students will work actively in groups to solve practical exercises.
- A06 Guided assignments (20 hours). Students will complete assignments, problems and exercises related to concepts seen in laboratory sessions and lectures.
- A07 Autonomous work (50 hours). Students are expected to spend about 50 hours to study theory, solve problems and prepare lab sessions
- A08 Assessment (5 hours).

The indicated hours are for guidance and will be adjusted depending on the academic calendar. At the beginning of the course, lecturers will communicate the schedule of practice sessions, which will be set according to the syllabus and the availability of laboratories and computer rooms.

4.3. Syllabus

The course will address the following topics:

1. Dynamics simulation of low-temperature solar thermal systems.
2. Photovoltaic - thermal hybrid collectors. Operating principles and applications.
3. Generation of cold from solar energy. Physical fundamentals and current state of the technology.
4. Solar thermal concentrating systems: parabolic trough collectors, linear Fresnel collectors, solar tower, Stirling disks, solar ovens. Operating principles and applications.
5. Applications: electricity, steam process use, integrated solar combined cycles (ISCC), solar energy in the chemical industry, solar desalination, hydrogen production from solar energy ...
6. Case studies: simulation of solar systems in specific applications.

4.4. Course planning and calendar

Further information concerning the timetable, classroom, assessment dates and other details regarding this course, will be provided on the first day of class or please refer to the website of the course (https://moodle2.unizar.es/add/)