

25892 - Bioinspired Design

Syllabus Information

Academic year: 2024/25

Subject: 25892 - Bioinspired Design

Faculty / School: 110 - Escuela de Ingeniería y Arquitectura

Degree: 558 - Bachelor's Degree in Industrial Design and Product Development Engineering

ECTS: 6.0

Year: 4

Semester: Second semester

Subject type: Optional

Module:

1. General information

The objective is to develop a design method from the perspective of bio-inspired design, for the detection of solutions "already solved" by nature that can satisfy product needs conducive to innovation. The forms of nature are assimilated and represented by means of specific organic design software.

Bio-inspired design is used in various fields of engineering, basing its study on the assimilation, imitation and knowledge of the natural environment to solve problems of a conceptual, functional, formal, structural, selective, communicative, etc.

2. Learning results

In order to pass this subject, the students shall demonstrate they have acquired the following results:

- Understand the existence of an alternative industrial design methodology, based on the observation of nature to obtain valid references that can be assimilated for the development of new products.
- Understand that nature is a source of ideas, that researching the natural world brings them closer to those ideas and allows them to adapt them to create innovations and product improvements.
- Be able to make new project approaches and establish alternative design processes, applying a new way of understanding the form-function relationship, the application of materials, structures, geometry of nature and simple and complex systems, always with references and analogies to living beings.

3. Syllabus

1. Definition of bio-inspired design, background and examples.
2. Bioinspired design methodologies.
3. Nature's references for bio-inspired design
4. Geometry and bio-inspired design.
5. Case studies.
6. Organic design software

4. Academic activities

In the classroom:

- Theoretical classes (10 hours). They will discuss bio-inspired design methodologies and their application to design
- Seminar classes or cases (20 hours). Development of exercises, some discussion and debate on topics proposed by the teacher
- Practical classes (30 hours). They are developed with computerized means of organic design

Work developed in practices and with autonomous work (60 hours):

- Project carried out through individual and group work
- Problem-based learning
- Learning specific software

27 hours are dedicated to the preparation of the test

The defense and presentation will take 3 hours

5. Assessment system

CONTINUOUS ASSESSMENT

The subject is evaluated in two parts with different percentages:

- First part, individual practical exercises with an evaluation of 60% of the practical part
- Second part, the group project with an evaluation of 40%

By means of these assignments, the work is monitored week by week (or every two weeks), all the exercises are done in the practical class and must be completed with personal or group work outside teaching hours.

All the information on the schedule of the proposed tests can be consulted in the ADD.

Note: Following the regulations of the University of Zaragoza in this regard, in the subjects that have continuous or gradual evaluation assessment, a global assessment test will also be scheduled for those students who decide to opt for this second system.

6. Sustainable Development Goals

4 - Quality Education

9 - Industry, Innovation and Infrastructure

12 - Responsible Production and Consumption