Universidad Zaragoza

Academic Year/course: 2024/25

30827 - Industrial Design and Environmental Management

Syllabus Information

Academic year: 2024/25
Subject: 30827 - Industrial Design and Environmental Management
Faculty / School: 105 - Facultad de Veterinaria
Degree: 568 - Degree in Food Science and Technology
ECTS: 6.0
Year: 3
Semester: Second semester
Subject type: Compulsory
Module:

1. General information

The production activity in companies is their raison d'être. In the development of the daily activity of a production plant it is necessary to perform different functions for the proper management of the production of the product, from the raw material to the finished product to be sent to the customer, as well as the control and maintenance of the production facility . In addition, it is necessary to control the emission of pollution into the environment.

For this reason, this subject seeks to introduce the student to the production environment and to know the elements that are part of it, as well as different techniques for planning and managing the production of the product and the control of the pollution generated. These approaches and objectives are aligned with the following Sustainable Development Goals (SDGs) of the United Nations Agenda 2030 (https://www.un.org/sustainabledevelopment/es/), in such a way that the acquisition of the learning results of the subject provides training and competence to contribute in some measure to their achievement:
Goal 3: Health and wellness.
Goal 6: Gender Equality.
Goal 7: Affordable and clean energy.

2. Learning results

The proposed learning results are:

1:Identifies the technical and legal specifications applicable to the design of installations and location of equipment in the production environment.

2: Knows and applies the techniques for production planning and management.

3: Proposes a storage and transportation system taking into account logistical factors of the product and the facility.

4: Identifies different automation systems to be used in the different sub-sectors of the agri-food industry.

5: Identifies and establishes the symbologies to be used for the coding of a product, and knows the systems for the capture and transmission of information along the product's Supply Chain.

6: Identifies the origin and effects of water pollution in the food industry, as well as the possible preventive and corrective measures aimed at pollution control.

7: Justifies the need to use integrated waste management systems.

8: Interprets basic regulations related to the environment.

9: Identifies industrial facilities that may affect the environment.

These are important since the design of the production facility, the manufacturing process and its possible automation, the determining factors of each product, an adequate planning and management of the production of the product and minimizing the environmental impact are fundamental knowledge for the development of the professional activity in the production environment by the student. Therefore, it is very convenient for the future graduate to have knowledge and skills related to industrial design and environmental management (which are present in the vast majority of agri-food fields nowadays). In addition, this subject allows the student to integrate knowledge acquired in previous subjects, as well as to obtain a clear business vision of the same.

3. Syllabus

The program of the subject is divided into six parts:
1. PRODUCTION PLANT
Practice 1 (P1): Basic tools for a good plant layout.
Topic 2. Design and analysis.
Practice 2 (P2): Dimensioning of spaces (warehouses, storage and production areas).

Practice 3 (P3): Materials flow and efficient distribution of space.

2: PRODUCTION AND MAINTENANCE PLANNING.
Topic 3. Production Planning.
Practice 4 (P4): Sales forecasting and Master Production Plan.
Practice 5 (P5): Material and resources requirements planning.
Topic 4. Production scheduling and control.
Topic 5. Integral industrial maintenance.
Topic 6. Supply chain management: warehousing and transportation of goods.

3: CONTROL AND AUTOMATION
Topic 7. Production control and automation.
Topic 8. Information capture and transmission systems Practice
Practice 6 (P6): Barcode and automatic identification systems

4: ENVIRONMENTAL MANAGEMENT
Topic 9: General concepts on environmental management.
Practice 7 (P7): Search for food industry facilities affected by the regulations.

5: WATER POLLUTION
Topic 10: General concepts on water quality and pollution.
Practice 8 (P8): Food industry wastewater treatment.
Topic 11: Water treatment systems.

6: WASTE MANAGEMENT
Topic 12: General concepts on waste management.
Practice 9 (P9, 2 sessions: P9a and P9b): Design and control of an aerobic waste composting process.
Topic 13: Main waste recovery and disposal treatments

4. Academic activities

The academic activities of this subject of 6 ECTS are: 150 hours/student distributed as follows: 30 hours of classroom lectures.

- 40 h of theoretical lessons.
- 1 hours of classroom problems.
- 3 hours of laboratory practice in small groups.
- 16 hours of computing laboratory practice in small groups.
- 86 h theoretical study.
- 4 h of exams.

The dates and key milestones for the subject are described in detail, along with those for all other third-year subjects of the FST Degree, on the Faculty of Veterinary Medicine website (link: http://veterinaria.unizar.es/gradocta/). This link will be updated at the beginning of each academic year

5. Assessment system

Continuous assessment:
Following the subject is recommended and in this sense a continuous assessment system is offered. Thus, during the term, the student will be able to demonstrate that they has achieved the required theoretical and practical learning results . If the student passes the continuous assessment tests in any of the two official calls, they don't need to take an exam on the topics included in these tests again.

1) Evaluation of practical teaching. It accounts for 40% of the final grade.
To assess the practical contents of the subject, students are expected to prepare a set of reports, associated to the problem and practical sessions, in which they will solve the cases presented using the tools learned. These reports will be delivered via Moodle within an agreed deadline after their proposal.
The criteria for evaluating these papers will be: adequate content, good approach, drawing interesting conclusions and good presentation.

In order to pass the subject and demonstrate that the student has achieved the expected learning results, the grade obtained in each of the assignments must be equal to or higher than 4 out of 10. Failure to deliver the corresponding report and/or obtaining grades lower than 4.0 in any report or questionnaire will result in a negative evaluation of this test.

2) Evaluation of theoretical teaching.
It will consist of 2 tests that will be carried out at the end of the didactic units and will represent 60% of the final grade:

- Control on Industrial Design: The knowledge acquired in the theoretical and problem classes of the blocks related to Industrial Design (blocks 1 to 3) will be evaluated with a written test consisting of solving theoretical-practical questions and problems related to the subject. It will be carried out during the term. The date for this test will be announced at the beginning of the term.
It represents 65% of the evaluation of the theoretical teaching and a minimum grade of 4 out of 10 must be obtained to

average this part.

- Environmental Management Control: The knowledge acquired in the theoretical classes and Control on Environmental Management of problems of the blocks related to Environmental Management will be evaluated with a written test with theoretical-practical and multiple-choice questions. It will be carried out during the term. The date for this test will be announced t the beginning of the term.
It represents 35% of the evaluation of the theoretical teaching and a minimum grade of 4 out of 10 must be obtained to average in this part.

In order to pass this test, a minimum grade of 4 out of 10 must be obtained in each of the two tests and the weighted grade of the theoretical teaching must be equal to or higher than 5.

In the event that any of the above conditions is not met, the grade will only be saved for the first call of the test whose grade is equal to or higher than 5.

Global assessment
To be taken on the date set by the centre, by students who have not passed the minimums of the continuous evaluation.
a) Global practice exam:
It accounts for 40% of the final grade. The student must take an exam corresponding to this part, being mandatory to pass it (grade obtained higher than 5) in order to pass the subject. The exam will consist of a written test (with short questions and resolution of small cases and problems) or with applications, tools and/or instruments specific to each case and will have an estimated duration of 0.5 h for each case. Students can choose to take only the part not passed during the continuous evaluation.

b) Written test related to the theoretical-practical contents:
It accounts for 60% of the final grade and a minimum grade of 5 out of 10 must be obtained. Its structure is similar to the tests of the continuous evaluation.
For students who would like to achieve a higher grade, it will be the maximum of the grades obtained from the grade obtained in the global exam and the previous grade, and they will have to take an exam on the theoretical-practical contents of the two blocks. This applies only to the first call.
The grade obtained from the weighted average of the tests must be equal to or higher than 5.0 to pass the subject. The results obtained in the tests passed will be maintained until the end of the academic year.
The results of the resolution of the practical cases will be kept in the following academic year for those students who have not passed the subject as long as they have obtained a grade equal to 5 in each case.

6. Sustainable Development Goals

3 - Good Health & Well-Being
6 - Clean Water and Sanitation
7 - Affordable and Clean Energy