Universidad Zaragoza

Year : 2020/21

30120 - Manufacturing Technology

Syllabus Information

Academic Year: 2020/21
Subject: 30120 - Manufacturing Technology
Faculty / School: 175 - Escuela Universitaria Politécnica de La Almunia
Degree: 425 - Bachelor's Degree in Industrial Organisational Engineering
ECTS: 6.0
Year: 2
Semester: Second semester
Subject Type: Compulsory
Module: ---

1.General information

1.1.Aims of the course

The great variety of objects, pieces, products ... that there are in the market have been obtained through a more or less complex productive process. This course provides the keys to determine some of them. Selecting a productive process is a global objective in the course.

A product has finish specifications, precision ... which are consistent with its function. Adapting the functionality of the product with criteria of sufficient quality makes the task of selecting a specific production process easier.

All manufactured components have a life and a cost. Connecting these variables and get the component to fulfill its function with guarantee is a challenge to achieve.

Selecting a productive process is the overall aim of the course.

1.2.Context and importance of this course in the degree

Each course of the degree aims at covering a field in the Technological and Scientific training of the student, in this case, the selection of a process. Success at completing this task will condition the viability of the product, both technically and economically.

Directing and managing a company, or a part of it, objective for the graduate who takes this degree, requires, among others, the competence to take action and, where appropriate, improve the productive process of the company.

1.3.Recommendations to take this course

There are no particular requirements to take this course. However, the contents to be taken will require the skills and abilities acquired, mainly, in the subjects of Technical Drawing, Statistics, Physics, Mathematics and Materials Engineering

2.Learning goals

2.1.Competences

Upon passing the course, the student will be more competent to ...

C38. Ability to apply basic knowledge of production and manufacturing systems.

C02. Ability to plan, budget, organize, direct and control tasks, people and resources.

C03. Ability to combine general and specialized knowledge of Engineering to generate innovative and competitive proposals in the professional activity.

C04. Ability to solve problems and make decisions with initiative, creativity and critical thinking.

2.2.Learning goals

The student, to succeed in this subject, must demonstrate the following results ...

- Acquiring a broad knowledge scope based on scientific, technological and economic criteria on the different manufacturing processes and systems.
- Identifying their advantages and disadvantages, as well as the defects that their application may show, the means of controlling and preventing them.
- Choosing the most suitable manufacturing processes based on knowledge of their capabilities and limitations and

according to the technological, technical and economic requirements of both the product and the market.

- Recognizing and applying basic considerations for configuring a process sheet.
- Interpreting the metrological control guidelines used to ensure the quality of products and processes.
- Learning about different automation systems and levels, selecting the most appropriate one based on productivity and flexibility criteria.
- Learning about the industrial quality models and ability to integrate manufacturing and measurement functions into them.
- Acquiring a critical attitude towards solutions already used, in a way that encourages the student to go forwards into the study and analysis of the topics that are the objective of this course and to proposing innovation strategies.

2.3.Importance of learning goals

The successful choice of a production process is an objective of the course that will undoubtedly contribute to improving the efficiency of the company.

The critical attitude towards solutions already used, so that they motivate the student to go forwards into the study and analysis of the subjects that are the objective of this course, favors the approach of new strategies and encourages innovation.

3.Assessment (1st and 2nd call)

3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

- **CONTINUOUS ASSESSMENT SYSTEM**

The student must demonstrate that they have achieved the expected learning outcomes by evaluating the following activities:

- **Laboratory practice tasks:** In each of the practice tasks the results obtained and the process followed will be evaluated. Once the practice is done, a report must be delivered according to the model. This activity is valued from 0 to 10 points. (This activity will be carried out in groups of 2/3 students, but the delivery is done individually). The final grade will be the average. Minimum score for each practice 3. Minimum score for the average 4.
- **Exercises and theoretical questions suggested:** The teacher will suggest exercises, problems, practical cases, theoretical questions, or presentation tasks to be done individually or in groups accordingly. This activity handed in properly will be valued between 0 and 10 points. The final grade will come from the average of all the exercises. Each exercise will have to reach a minimum mark of 3. Minimum score for the average 4.
- **Written assessment tests:** They will consist of a written exam (theory and problems) graded from 0 to 10 points. The final grade of this part will be given by the average of the tests, as long as there is no one graded below 4 points, in this case the part will be failed. Minimum average score 4.

As a summary of the aforementioned, the following weighting table of the grading process of the different activities, in which the continious assessment process of the course has been based, has been designed

ASSESSMENT ACTIVITY	WEIGHTING
Laboratory practice tasks	20%
Exercises and theoretical questions	10%
Written assessment tests	70%

After the weighting, the mark to pass the subject must be equal to or greater than 5

To opt for the Continuous Assessment System, you must attend at least 80% of the classroom activities.

In case of not succeeding with this system, the student will have two additional calls to do so (global assessment test). On the other hand, the student who has passed the subject through the continuous assessment system, may also opt for the final assessment , on the first call, to upgrade a mark but never to lower it.

If, during the Continuous assessment period, some of the tests are not passed, this or these can be recovered in the June global exam, being assessed according to the Continuous assessment system

- **GLOBAL ASSESSMENT TEST**

The student must opt ??for this modality when, due to their personal situation, they cannot adapt to the rhythm of work required in the continuous assessment system, or they have failed or want to upgrade their mark having participated in the above mentioned assessment methodology.

The global final assessment test will have the following group of qualifying activities:

Written exam: It will consist of a test that will contain questions and problems concerning the topics covered throughout the course. The grading of this test goes from 0 to 10 points (minimum score 5).

Laboratory practice exam: The student who has not passed the lab practical tasks carried out along the course will have to

take a written exam about their content. This test will be graded from 0 to 10 points (minimum score 5).

Weight table for the global assessment:

Assessment task	Weight
Written exam	85%
Laboratory Practice Exam	15%

After the weighting, the mark to pass the subject must be equal to or greater than 5

If the Laboratory Practices have been passed in the Continuous Assessment (with a mark equal to or greater than 5), this grade will be valid for the Global Assessment part, and the student will not have to take the Laboratory Practice exam

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

The organization of teaching will be carried out using the following steps:

- **Lectures**: Given to the whole group, basically given by the teacher, in such a way as to explain the theoretical supports of the subject.
- **Practice Sessions**: The teacher resolves practical problems or cases for demonstrative purposes. This type of teaching complements the theory shown in the lectures with practical aspects.
- **Laboratory Workshop**: The lecture group is divided up into various groups, according to the number of registered students, but never with more than 20 students, in order to make up smaller sized groups.
- **Individual Tutorials**: Those carried out giving individual, personalized attention with a teacher from the department. Said tutorials may be in person or online.

"If classroom teaching were not posssible due to health reasons, it would be carried out on-line"

4.2.Learning tasks

The course includes the following learning tasks:

- Theoretical/practical lessons and Lab practice tasks. Four hours a week, until the 60 hours needed to cover the syllabus are completed.
- Lab practice tasks. Sessions will be held with subgroups adapted to the laboratory capacity.
- Study and personal work. This off-site part is given about 90 hours, necessary for the study of the theory, problem-solving and questionnaires, work production and revision of scripts.
- Tutorials and generic off-site activities. Each teacher will publish student service timetable throughout the four-month period

4.3.Syllabus

The course will address the following topics:

Contents:

- **Topic 1. Metrology.** Introduction to Metrology. Measuring Instruments: Direct and indirect measurement. Surface roughness. Tolerances and fittings.
- **Topic 2. Process Control.** Process Capability Studies. Control Chart.
- **Topic 3. Moulding.** Introduction to the casting process. Types of Casting Process. Economical and Technical considerations.
- **Topic 4. Plastic Deformation Processes.** Metal Rolling. Metal Forging. Metal Extrusion and Stretching. Operations in metal sheets.
- **Topic 5. Welding and Joining Processes.** Joining Processes. Metallurgy and Welding Processes.
- **Topic 6. Machining Processes.** Fundamentals of cutting. Machine tools.

Practicing contents:

- Practice 1. Thread control.

- Practice 2. Gear control.
- Practice 3. Measurement of angles and conicity.
- Practice 4. Verification of roughness, tolerance control on-axis, depth measurement, the distance between holes.
- Practice 5. Measurement and sketching of a mechanical component.

4.4.Course planning and calendar

The lectures and problem lessons are taught in the timetable organized by the School, as well as the hours assigned to laboratory practice tasks.

In the continuous assessment system the dates of the written assessment tests will be posted on the Digital Teaching Platform (ADD) along the course.

The weekly schedule of the subject will be published at
http://www.eupla.unizar.es/asuntos-academicos/calendario-y-horarios

The dates of the global evaluation test (official calls) will be published at
http://eupla.unizar.es/asuntos-academicos/examenes

4.5.Bibliography and recommended resources

http://biblos.unizar.es/br/br_citas.php?codigo=30120&year=2020