

Academic Year/course: 2021/22

30126 - Quality

Syllabus Information

Academic Year: 2021/22

Subject: 30126 - Quality

Faculty / School: 175 - Escuela Universitaria Politécnica de La Almunia
179 - Centro Universitario de la Defensa - Zaragoza

Degree: 425 - Bachelor's Degree in Industrial Organisational Engineering
563 - Bachelor's Degree in Industrial Organisational Engineering

ECTS: 6.0

Year: 3

Semester: 563-First semester o Second semester

425-Second semester

457-Second semester

107-Second semester

Subject Type: Compulsory

Module:

1. General information

1.1. Aims of the course

The course and its expected results respond to the following approaches and objectives:

The overall objective of the subject is to provide the knowledge and skills necessary for the planning, management, control and continuous improvement of tasks, activities and operating processes that take place in current organizations to ensure the total satisfaction of the parties acting on the management of quality.

Specifically, the following academic objectives are pursued:

- Enable the student to understand the different meanings of the concept of quality, differentiate among the standardization, homologation and certification activities and use the different techniques and tools of quality management.
- Students should be able to learn and use the fundamental aspects of quality assurance both in the design, and in the manufacturing process or in the purchasing strategy.
- Students must be capable of analysing the procedural and documentary structure of different quality management systems.

These approaches and objectives are in line with the following Sustainable Development Goals (SDGs) of the United Nations 2030 Agenda (<https://www.un.org/sustainabledevelopment/es/>), in such a way that the acquisition of the course learning outcomes provides training and competence to contribute to their achievement to some degree.

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- 4.3 By 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university.
- 4.4 By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship.
- 4.7 By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development.
- 5.5 Ensure women's full and effective participation and equal opportunities for leadership at all levels of decisionmaking in political, economic and public life.
- 8.3 Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services.
- 9.2 Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of

employment and gross domestic product, in line with national circumstances, and double its share in least developed countries.

- 9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities.
- 12.8 By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature.
- 16.7 Ensure responsive, inclusive, participatory and representative decision-making at all levels.

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- Objective 4: Quality education.
- Objective 5: Gender equality.
- Objective 8: Decent work and economic growth.
- Objective 9: Industry, innovation and infrastructure.
- Objective 12: Responsible consumption and production.
- Objective 16: Peace, justice and strong institutions.

1.2. Context and importance of this course in the degree

Quality is a management subject which uses the knowledge of other subjects related to the internal management of the company, such as business management and organization, production Management, etc., as well as other subjects with mathematical contents such as those studied in the subject of Statistics, in order to provide the student with the necessary skills that a manager must have at the present time. Beyond the tools and management techniques learned, the student will be able to differentiate and implement new systems and methodologies of quality management in Organizations.

Specialization in Defence

This subject contributes to the training of Spanish Army Officers, providing the knowledge and developing the skills that Spanish Army Officers need to carry out their mission.

1.3. Recommendations to take this course

The recommendations to take the subject of Quality are the usual ones to access the studies of any engineering degree, basically, having completed the scientific-technological courses at the higher secondary-education level. It is advisable to have passed the subject of Statistics.

To follow this course correctly, it is also necessary to be willing to carry out a continuous work and effort from the beginning of the course. Therefore, daily work on the subject is required to be able to carry out an adequate follow-up of the classes. It is advisable that the student solve their doubts as they arise, both in the classroom and with the help of tutorials and resources that the teacher makes available.

2. Learning goals

2.1. Competences

When the student completes the course he/she will have acquired the following competences:

1. Ability to plan, budget, organise, manage and monitor tasks, people and resources.
2. Ability to solve problems and take decisions with initiative, creativity and critical reasoning.
3. Ability to apply Information and Communication Technologies (ICTs) within the field of engineering.
4. Ability to manage information; skills to handle and apply technical specifications and the necessary legislation to practise engineering.
5. Ability to continue learning and develop self-learning strategies.
6. Knowledge and capacities to direct and manage quality systems in businesses and institution.

2.2. Learning goals

In order to pass this course, the student must prove the following results:

1. He describes the different meanings of the concept of quality and its repercussions.
2. He describes, differentiates and uses the different techniques and tools for quality management.
3. He describes and differentiates the activities of Standardization, Homologation and Certification.

4. He distinguishes the elements that form part of the quality measurement process in industrial and service companies.
5. He predicts the existence of errors in every measurement process, distinguishing its nature and origin.
6. He validates if a measurement process meets or not the established quality requirements.
7. He calculates the correction and uncertainty as a result of the calibration process of an instrument.
8. He describes the standards and the steps in the certification process of a quality system.

2.3. Importance of learning goals

Nowadays, responsibility for the quality management systems of organizations is a fundamental competence for an Engineer in Industrial Organization. In addition, the knowledge acquired in this area is the basis for other subjects in the degree such as Production Management, Logistics or Innovation Management and Technology Policy.

3. Assessment (1st and 2nd call)

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

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The assessment activities planned for this subject in this school will have the following weighting:

1. Part 1.
 1. Practical assignments 35% (minimum mark 1.4 point to be able to add the other grades of the subject)
 2. Theoretical tests 15% (minimum mark 0.6 point to be able to add the other grades of the subject)
 3. Call assessment, theoretical-practical exam 50%
2. Part 2.
 1. Practical assignments 35% (minimum mark 1.4 point to be able to add the other grades of the subject)
 2. Theoretical tests 15% (minimum mark 0.6 point to be able to add the other grades of the subject)
 3. Call assessment, theoretical-practical exam 50%

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The assessment activities planned for this subject in this school will have the following weighting:

1. Practical assignments 50%.
2. Theoretical test 50%.

The grade obtained in the final exam must be at least equal to 5.0 to pass the course.

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

The learning process designed for this subject is based on the following:

Strong interaction between the teacher/student. This interaction is brought into being through a division of work and responsibilities between the students and the teacher. Nevertheless, it must be taken into account that, to a certain degree, students can set their learning pace based on their own needs and availability, following the guidelines set by the teacher.

The current subject (Quality) is conceived as a stand-alone combination of contents, yet organized into three fundamental and complementary forms, which are: the theoretical concepts of each teaching unit, the solving of problems or resolution of questions and laboratory work, at the same time supported by other activities.

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

- **Lectures:** Theoretical activities carried out mainly through exposition by the teacher, where the theoretical supports of the subject are displayed, highlighting the fundamental, structuring them in topics and or sections, interrelating them.

- **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.
- **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 possible due to health reasons, it would be carried out on-line

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This is a 6 ECTS course organized as follows:

- **Theory and practice sessions** that allow the transmission of knowledge to the students, promoting the participation of them, in which, case studies will be resolved as well as theory will be taught without having an explicit separation between.
- Computer **lab sessions** that will be taught in the classroom with laptops available to students or in the computer labs.
- Realization of **supervised assignments (optional)**. Students will work in groups under the supervision of their teachers.
- **Tutorials and personalized attention** both in small groups or individualized during the established office hours.
- **Autonomous work and study** by students from the beginning and along with of the course.

It must be taken into account that the course has both theoretical and practical orientation. Therefore, the learning process emphasizes as much as in the participation of students in the different sessions, as in the realization of exercises and lab sessions, and in the autonomous work and study.

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

4.2. Learning tasks

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The program offered to the student to help them achieve their target results is made up of the following activities...

Involves the active participation of the student, in a way that the results achieved in the learning process are developed, not taking away from those already set out, the activities are the following:

Face-to-face generic activities:

- **Lectures:** The theoretical concepts of the subject are explained and illustrative examples are developed as a support to the theory when necessary.
- **Practice Sessions:** Problems and practical cases are carried out, complementary to the theoretical concepts studied. Visits to companies about the content of this subject may also be made and questions may be included in continuous assessment.

Generic non-class activities:

- Study and understanding of the theory taught in the lectures.
- Understanding and assimilation of the problems and practical cases solved in the practical classes.
- Preparation of seminars, solutions to proposed problems, etc.
- Preparation of summaries and reports.
- Preparation of the written tests for continuous assessment and final exams.

The subject has 6 ECTS credits, which represents 150 hours of student work in the subject during the trimester, in other words, 10 hours per week for 15 weeks of class.

A summary of a weekly timetable guide can be seen in the following table. These figures are obtained from the subject file in the Accreditation Report of the degree, taking into account the level of experimentation considered for the said subject is moderate.

Activity	Weekly school hours
Lectures	3
Laboratory or practical Workshop	1
Other Activities	6

Nevertheless, the previous table can be shown in greater detail, taking into account the following overall distribution:

- 50 hours of lectures, with 30% theoretical demonstration and 70% solving type problems.
- 6 hours of written assessment tests, one hour per test.

- 4 hours of PPT presentations.
- 90 hours of personal study, divided up over the 15 weeks of the 2nd semester.

There is a tutorial calendar timetable set by the teacher that can be requested by the students who want a tutorial.

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Teachers of the course inform the students about the program with the specific dates of the activities through the Moodle platform that can be consulted by logging with their username and password at the address <https://moodle2.unizar.es/add/>. These activities are a combination of the learning activities and evaluation activities:

Classroom learning activities

- Type I activities. Lectures (theory and exercises)
- Type II activities. Supervised assignments
- Type III activities. Computer lab sessions
- Type IV activities. Assessment activities:
 - Final examination
 - Continuous assessment during lectures, practice sessions, and supervised activities.

non-classroom learning activities

- Type II activities. Supervised assignments
- Type V activities. Autonomous work and study

4.3. Syllabus

The course will address the following topics:

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- Unit 1. Quality Basic concepts
- Unit 2. Historical development of quality
- Unit 3. Quality costs
- Unit 4. Quality planning
- Unit 5. Quality in design, purchasing, and process
- Unit 6. Product and Process Quality Control
- Unit 7: Measurement Assurance. Metrology.
- Unit 8. Quality Improvement Tools
- Unit 9. ISO 9001
- Unit 10. Company Certification
- Unit 11. Integrated Management Systems

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The subject syllabus is the next one:

1. Quality Scope and Definition
2. Quality Management Systems
3. Quality Planning
4. Quality Control Techniques and Tools
5. Quality in Design
6. Quality in Manufacturing
7. Procurement Process Quality
8. Measurement System Analysis. Metrology

4.4. Course planning and calendar

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Class hall sessions & work presentations timetable

The dates of the final exams will be those that are officially published at <http://www.eupla.es/secretaria/academica/examenes.html>.

The written assessment tests will be related to the following topics:

- **Test 1:** Topic 1.

- **Test 2:** Topic 2.

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A summary of a weekly timetable guide can be seen in the following table, which could be modified in view of different teaching activity matters:

Topic	Contents	Week
0	Course presentation	1
1	Introduction: Quality Scope and Definition	1-2
2	Quality Management Systems	2-3
3	Quality Planning	3-4
4	Quality Control Techniques and Tools	5-7
5	Quality in Design	8-10
6	Quality in Manufacturing	11
7	Procurement Process Quality	12-13
8	Measurement System Analysis. Metrology	13-15

The planning of the sessions and final examinations are available on the website of the institution <http://cud.unizar.es/calendarios>.

The submission scheme of exercises and reports of continuous learning activities (type II and III activities) are notified to the students either during the development of the class itself or through the Moodle platform: <https://moodle2.unizar.es/add/>

4.5. Bibliography and recommended resources

Bibliography

- Specialization in Bussiness: <http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=30126>
- Specialization in Defence: <http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=30126>

Resources

Classroom materials will be available via Moodle at <https://moodle2.unizar.es/add/>. These include a repository of the lecture notes used in class, the course syllabus, as well as other course-specific learning materials, including a discussion forum.

Further information concerning the timetable, classroom, office hours, assessment dates and other details regarding this course will be provided on the following websites:

- Specialization in Business: <http://eupla.unizar.es> and Moodle course.
- Specialization in Defence: <http://cud.unizar.es> and Moodle course.