

Quality Assurance and Reliability

Code: 102716
ECTS Credits: 6

Degree	Type	Year	Semester
2500895 Electronic Engineering for Telecommunication	OT	4	2
2500898 Telecommunication Systems Engineering	OT	4	2

Contact

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Use of Languages

Principal working language: spanish (spa)
Some groups entirely in English: No
Some groups entirely in Catalan: No
Some groups entirely in Spanish: No

Prerequisites

No prerequisite is required for the students of the degree.

Objectives and Contextualisation

The objectives are that the student acquires the competences related to the management of the quality and the reliability, within the context of the optional matter of Quality and Production. The subject is specifically oriented towards the field of electronic engineering and telecommunication systems. The student must be able to design quality plans and specify and differentiate levels of quality in production processes. In addition, the student can analyze the reliability of systems, design proof tests of reliability and contrast them with specifications of reliability through international standards.

Competences

Electronic Engineering for Telecommunication

- Apply basic elements of economics and human resource management, organisation and planning of projects.
- Apply the necessary legislation in the exercise of the telecommunications engineer's profession and use the compulsory specifications, regulations and standards
- Develop personal attitude.
- Develop personal work habits.
- Resolve problems with initiative and creativity. Make decisions. Communicate and transmit knowledge, skills and abilities, in awareness of the ethical and professional responsibilities involved in a telecommunications engineer's work.
- Work in a team.

Telecommunication Systems Engineering

- Apply basic elements of economics and human resource management, organisation and planning of projects.
- Apply the necessary legislation in the exercise of the telecommunications engineer's profession and use the compulsory specifications, regulations and standards.
- Develop personal attitude.

- Develop personal work habits.
- Resolve problems with initiative and creativity. Make decisions. Communicate and transmit knowledge, skills and abilities, in awareness of the ethical and professional responsibilities involved in a telecommunications engineer's work.
- Work in a team.

Learning Outcomes

1. Develop curiosity and creativity.
2. Generate innovative and competitive proposals in professional activity.
3. Identify and manage the aspects of ethical and professional responsibility in accordance with the planning of quality and reliability in electronic or telecommunications systems.
4. Identify those aspects that require decision-making process due among others to the flexibility with which they have been endowed current manufacturing systems.
5. Make one's own decisions.
6. Manage available time and resources.
7. Manage available time and resources. Work in an organised manner.
8. Manage, organise and plan standard procedures in specifications and reliability tests in the field of electronics and communications.
9. Manage, organize and plan standardized specifications and reliability testing procedures in the field of electronics and communications.
10. Prevent and solve problems.
11. Specify and apply standard procedures for quality control and design of acceptance plans.
12. Specifying and implementing the standard for quality control and design plans acceptance procedures.
13. Work cooperatively.
14. Work in complex or uncertain surroundings and with limited resources.

Content

Brief description of the contents:

- Quality management in the field of Electronics and Telecommunications
- Statistical process control.
- Design of quality acceptance plans.
- Reliability of simple and complex systems.
- Reliability test design.
- Maintenance and availability.

Methodology

Classroom teaching along with work to be performed by the student, classroom work and practical sessions. The virtual campus and electronic repositories will be used as tools for communication and documentary support.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Practical sessions	9	0.36	1, 11, 2, 7, 8, 3, 5, 10, 13, 14
Problems	11	0.44	1, 11, 2, 7, 8, 3, 5, 10, 13, 14

Theoretical classes and follow-up in the classroom	22	0.88	11, 7, 8, 3
Type: Supervised			
Tutorials	12	0.48	1, 11, 2, 7, 8, 3, 5, 10, 13, 14
Type: Autonomous			
Study, problem solving and reporting	84	3.36	1, 12, 11, 2, 6, 7, 8, 9, 3, 4, 5, 10, 13, 14

Assessment

a) Scheduled evaluation process and activities

The evaluation of the acquisition of competences by students is done with continuous evaluation, according to these criteria:

- A. Assistance and active participation in class. (10%)
- B. First partial exam, half of the semester aprox. (30%)
- C. Second partial exam, towards the end of the semester. (30%)
- D. Delivery and/or presentation of reports and work. Throughout the course will be proposed reports and work to be done that students must submit and in some cases present in the classroom. (10%)
- E. Realization and reports of the practical sessions. (20%).

To be able to pass the subject, through continuous assessment, you must obtain a minimum mark of 3.5/10 points in activities B,C and E, and a minimum of 5/10 points altogether. It must be keep in mind that activities A, D and E are not recoverable.

For academic needs, and according to the development of the course, the evaluation procedures may be adjusted by the teacher.

b) Programming evaluation activities

The programming of evaluation activities B, and C will be made public through the Virtual Campus.

c) Recovery process

The student can apply for recovery provided that he/she has been previously evaluated of activities B,C and E. In accordance with the coordination of the Degree and the direction of the School of Engineering, the following activities can not be recovered: Activity A, 10% of the final grade; Activity D, 10% of final grade; and Activity E, 20% of the final grade

d) Procedure for review of qualifications

For activities B,C and E a place, date and time of review will be indicated. Claims may be made on the activity grade, which will be evaluated by the faculty responsible for the subject. If the student does not show up in this programmed review session, this activity will not be reviewed later.

e) Qualifications

The regulations of the UAB indicate that MH can only be granted to students who have obtained a final grade equal to or greater than 9.00. You can grant up to 5% of MH of the total number of students enrolled.

Not Evaluable: A student will be considered not evaluable (NA) if he has not presented in a set of activities the weight of which equals a minimum of two thirds of the total grade of the subject.

Final mark for the evaluable students. To pass it is necessary that the evaluation of each of the parties exceeds the minimum grade required and that the total evaluation, taking into account the weights of each activity, have a grade equal to or greater than 5. In case of not passing the subject, the numerical note of the file will be the lowest value between 4.5 and the weighted average of the notes.

f) Irregularities by the student, copy and plagiarism

Without prejudice to other disciplinary measures deemed appropriate, the irregularities committed by the

student that may lead to a variation of the grade of an evaluation act will be scored with a zero. Therefore, copying, plagiarism, cheating, letting copy, etc. in any of the evaluation activities will involve suspending with a zero. The evaluation activities qualified in this way and by this procedure will not be recoverable. If it is necessary to pass any of these evaluation activities to pass the subject, this subject will be suspended directly, without the opportunity to recover it in the same course. The final grade will be that which results from the corresponding weights of each part, but at most a final grade of the subject of 3 points.

h) Evaluation of repeating students

From the second enrollment, the evaluation of the subject will consist of a synthesis test, plus the note corresponding to the activities A, D and E obtained the first time the student has enrolled in the subject. The calculation of the grade will be done in accordance with the established weights for each of the activities. To be eligible for this differentiated evaluation, the repeating student must ask the teacher by email no later than 4 weeks after the start of the classes and indicating for which AD and E activities that the previously obtained grade is retained.

The proposed teaching and evaluation methodologies may be subjected to modification, depending on possible restrictions imposed by the health authorities on face-to-face attendance.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
1st partial exam	30%	2	0.08	1, 12, 11, 2, 6, 7, 8, 9, 3, 4, 5, 10, 14
2nd partial exam	30%	2	0.08	12, 11, 2, 6, 7, 8, 9, 3, 4, 5, 10, 14
Attendance and active participation in class	10%	0	0	1, 12, 11, 2, 6, 7, 8, 9, 3, 4, 5, 10, 13, 14
Delivery and / or presentation of reports and homework	10%	4	0.16	1, 12, 11, 2, 6, 7, 8, 9, 3, 4, 5, 10, 13, 14
Realization and reports of the practical sessions	20%	0	0	1, 11, 2, 7, 8, 3, 5, 10, 14
Recovery exam	60%	4	0.16	1, 12, 11, 6, 7, 8, 9, 3, 4, 5, 10, 14

Bibliography

The Assurance sciences : an introduction to quality control and reliability / Siegmund Halpern	Halpern, Siegmund
Handbook of reliability engineering / Hoang Pham (editor)	--
Handbook of reliability engineering [Recurs electrònic] / Hoang Pham (editor)	--
Infraestructuras comunes de telecomunicaciones para el acceso a los servicios de telecomunicación en el interior de las edificaciones [Recurs electrònic] : Normas UNE y legislación / AENOR	Asociación Española de Normalización y Certificación
Introduction to statistical quality control / Douglas C. Montgomery	Montgomery, Douglas C.
Operations and supply chain management / Roberta S. Russell, Bernard W. Taylor III	Russell, Roberta, autor
Principles of quality control / Jerry Banks	Banks, Jerry G.

Quality engineering handbook / Thomas Pyzdek ; edited by Paul A. Keller	Pyzdek, Thomas
Reliability, quality, and safety for engineers / B. S. Dhillon	Dhillon, B. S.
Statistical process control [Recurs electrònic] / John S. Oakland	Oakland, John S.
UNE-ISO 2859-1 : procedimientos de muestreo para la inspección por atributos / Asociación Española de Normalización y Certificación (AENOR)	--

Software

Matlab and advanced MS Excel