

Course guide

240EQ023 - 240EQ023 - Control, Verification and Audit

Last modified: 26/06/2025

Unit in charge: Barcelona East School of Engineering
Teaching unit: 713 - EQ - Department of Chemical Engineering.

Degree: **Academic year:** 2025 **ECTS Credits:** 3.0
Languages: English

LECTURER

Coordinating lecturer: Rosa Maria Darbra Roman

Others:

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

3. Lead and manage work organization and human resources applying criteria of industrial safety, quality management, risk prevention, sustainability, and environmental management.
4. Manage and perform verification, control of facilities, processes and products, as well as certifications, audits, inspections, tests and reports.

Generical:

5. Possess independent learning skills to maintain and enhance the competencies of chemical engineering to enable the continued development of their profession.
6. Ability to analyze and synthesize to the continued progress of products, processes, systems and services using criteria of safety, affordability, quality and environmental management.

TEACHING METHODOLOGY

Subject in process of extinction. There is no teaching, the students that enroll it do so only with the right to an exam.

LEARNING OBJECTIVES OF THE SUBJECT

This subject aims to introduce to the students to the different internal control structures that allow companies to manage three of the most important aspects of an organization: the quality of the product or service, the environmental impact and the safety management.

At the end of this subject, the students will be able to:

1. Identify the most common quality, environmental and safety management systems as well as the methodology to implement them in any organization.
2. Determine the most suitable methodology for the quantification of the environmental impact of a given activity.
3. Appreciate the benefits obtained from the application of a quality management system in an organization or industry.
4. Identify the legal requirements that a company needs to know concerning the safety of their workers, installations and environment.
5. Get a global vision of the integration of three management systems in one organization.

STUDY LOAD

Type	Hours	Percentage
Hours large group	27,0	36.00
Self study	48,0	64.00

Total learning time: 75 h

CONTENTS

Introduction to the Management Systems

Description:

In this first chapter, a global vision of the subject will be given together with a set of basic definitions that allow the understanding of the concepts that will be used in the forthcoming chapters.

Specific objectives:

Objectives from 1 to 5

Related activities:

There will be a 3 hours lecture and the students will have to read some papers and other documentation at home related to the introductory concepts.

Full-or-part-time: 6h

Theory classes: 3h

Self study : 3h

Environmental Management Systems

Description:

In this chapter different aspects related to the environment that affect companies, organizations and the society will be introduced. Different methodologies will be presented according to the scope of the activity (project, production process, and product).

Specific objectives:

Objectives 1 and 2

Related activities:

There will be 5 hours of lectures and one practical activity of two hours. In addition, the students will have to carry out some previous work to prepare the practical activity, then write the report of results obtained and finally, start to prepare the team project of the subject.

Full-or-part-time: 19h

Theory classes: 5h

Practical classes: 2h

Self study : 12h

Quality Management Systems

Description:

In this chapter, diverse methodologies that allow the companies to management the quality of the product or service are presented. Moreover, the benefits of certifying the quality management system will be also highlighted.

Specific objectives:

Objectives 1 and 3

Related activities:

There will be lectures for 4 hours of lectures. There will be also a visit (2hrs) to a chemical plant. As independent learning, the students will have to continue working on the final work (with tutorials with the lecturer) and personal study.

Full-or-part-time: 16h

Theory classes: 6h

Self study : 10h

Safety Management Systems

Description:

There will be a presentation of the safety management systems, highlighting their importance and the potential certifications such as OSHAS 18001 of Occupational Health and Safety.

Specific objectives:

Objectives 1 and 4

Related activities:

There will be a 4 hours lecture and then a practical class of 2hrs. The students will prepare the practical class report and proceed to finish the team project and also devote some time to personal study.

Full-or-part-time: 16h

Theory classes: 4h

Practical classes: 2h

Self study : 10h

Integration of the three management systems

Description:

In this chapter, the synergies among the three management systems (environmental, quality and safety) will be presented. Moreover, it will be shown how the integration of all of them means an optimization of resources for the companies and organizations.

Specific objectives:

Objectives 1 and 5

Related activities:

There will be two hours of lectures and one seminar with an expert on this topic. After this, the students will present their team project final report (4 hours) in front of the rest of students. The students will have to prepare beforehand this presentation and also deliver the final team project.

Full-or-part-time: 18h

Theory classes: 8h

Self study : 10h

ACTIVITIES

PRACTICAL CLASSES

Description:

The practical classes will deliver complementary information and also reinforce the lectures in order to improve the knowledge of the students on the topic.

Specific objectives:

To apply the concepts and methods explained at class through practical exercises that allow the student to solve an applied activity.

Material:

Practical class documentation with guidelines, computers, report, etc.

Delivery:

Delivery of preliminary report and final report.

Full-or-part-time: 8h

Self study: 4h

Practical classes: 4h

VISIT

Description:

Visit a company or an organization where the three management systems explained at class have been implemented.

Specific objectives:

To observe at first hand the implementation of the environmental, safety and quality management systems in a company. In addition, this visit will help the students to understand the importance of these systems and the benefit of their integration.

Material:

The one provided by the company.

Delivery:

Delivery of a visit report a week after the visit.

Full-or-part-time: 4h

Self study: 2h

Theory classes: 2h

FINAL TEAM PROJECT

Description:

The students will select one simple production process and they will have to implement one of the management systems studied at class (environmental, safety or quality).

Specific objectives:

To deal with a challenging situation as the one of implementing a management system in a company. The students will have to learn how to manage/implement/develop/assess a specific management system working in a team. After, they will have to communicate efficiently to the rest of the students the most significant results and the lessons learned during the team project.

Material:

Bibliographic research, computers, companies' visits, lecturers' tutorials, etc.

Delivery:

2 preliminar deliveries to follow the progress and a final delivery of the written final team project and an oral presentation.

Full-or-part-time: 24h

Self study: 20h

Theory classes: 4h

LECTURES

Description:

Explain the different topics of the subject.

Specific objectives:

Comply with those fixed in the subject.

Material:

Slides, exercises and papers. All is available at the atena platform.

Full-or-part-time: 39h

Self study: 19h

Theory classes: 20h

GRADING SYSTEM

Subject in process of extinction. There is only one final test that corresponds to 100% of the final grade of the subject.

BIBLIOGRAPHY

Basic:

- Guia pràctica per a la implantació d'un sistema de gestió ambiental. Barcelona: Generalitat de Catalunya, 2000. ISBN 8439352816.
- Burriel Lluna, G. Sistema de gestión de riesgos laborales e industriales. 2a ed. Madrid: MAPFRE, S.A, 1999. ISBN 8471008319.
- CCPS. Guidelines for integrating process safety management, environment, safety, health, and quality [on line]. New York: AIChE, 1996 [Consultation: 22/05/2020]. Available on: <http://site.ebrary.com/lib/upcatalunya/docDetail.action?docID=10419178>. ISBN 9780470935101.
- Hoyle, D. ISO 9000 quality systems handbook : using the standards as a framework for business improvement [on line]. 6th ed. Oxford: Butterworth-Heinemann, 2009 [Consultation: 22/05/2020]. Available on: <http://site.ebrary.com/lib/upcatalunya/docDetail.action?docID=10310707>. ISBN 9780080958033.
- Abril, C. ; Enríquez, A. ; Sánchez, J.M. Guía para la integración de sistemas de gestión : Calidad, Medio Ambiente y Seguridad y Salud en el Trabajo. 2a ed. Madrid: FC Editorial, 2012. ISBN 9788493961879.

Complementary:

- Edwards, A. J. ISO 14001 environmental certification step by step [on line]. Amsterdam: Elsevier Butterworth-Heinemann, 2004 [Consultation: 22/05/2020]. Available on: <http://www.sciencedirect.com/science/book/9780750661003>. ISBN 9780750661003.
- Center for Chemical Process Safety. Guidelines for implementing process safety management systems. New York: American Institute of Chemical Engineers, 1994. ISBN 0816905908.
- Cuatrecasas, Lluís. Gestión integral de la calidad : implantación, control y certificación. Barcelona: Ediciones Gestión 2000, 2010. ISBN 9788496998520.