60641 - Environmental legislation and management systems

Información del Plan Docente

Academic Year	2017/18
Faculty / School	100 - Facultad de Ciencias
Degree	540 - Master's in Industrial Chemistry
ECTS	9.0
Year	1
Semester	Annual
Subject Type	Compulsory
Module	---

1.General information

1.1.Introduction

The increase in productivity and competitiveness of the chemical sector requires, among other measures, the training of professionals with knowledge of the efficiency of organizations such as quality tools and process and product control. Also, given the great international positioning of the Sector, it is necessary to have a formation in the legislative references that regulate it.

In order to achieve these objectives, the subject "Management Systems and Environmental Legislation" develops a series of key competencies that affect the mentioned aspects.

It provides to the student with a global vision of Quality Management Systems, Environment, and Occupational Risk Prevention. The main European Directives and Regulations of the sector are discussed. And they also develop the principles of Quality Assurance that could be applicable in the Chemical Laboratory.

Quality management, implemented through standardized management systems, is essential to ensure the efficiency of industrial production processes. These systems pursue compliance with product requirements that necessarily include customer requirements. The same happens with the Environmental Management Systems or Occupational Hazard Prevention, which in these cases should accomplish official regulations.
The Quality Management in the laboratory is developed according to the models of Quality Control and Q. Assurance of results. They are current principles and mark the differences between Quality Management and Quality Assurance. This establishes and exposes the principles of ISO 9000-1 to the laboratory and the chemical industry to ensure quality management, while the Quality models of the standards GLP and UNE-EN ISO 17025 affect the Quality Assurance and Are based on actions with: Assurance, Evaluation and Quality Control. Those are the support of confidence.

The quality of the laboratory is linked to that of the result and the chemical measurement. The methods of evaluation/measurement and traceability are described by means of calibration actions and use of reference standards. The two main accreditation standards of the laboratory are preferably treated. They are developed in different fields of application. They have common elements but also important differences that contrast and compare.
The subject is proposed to expose the structure of the main contents and then approach its development and implementation of a practical way. That is, through a strategy based on the resolution and application to practical cases. And intends the involvement of the student in an active way.

The subject also addresses the knowledge and application of current environmental legal regulations. The subject

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examines European Union law in general and the REACH and CLP Regulations in particular. All this, in order to train future professionals of the specialty in Chemistry so that they can develop a professional career with current competence in environmental and quality regulations and standards and also with basic legal knowledge.

1.2.Recommendations to take this course

It is recommended to have basic knowledge on Management Systems. Also, it is advisable to have training in statistics and chemometrics tools. The handling of worksheets, like excel, is necessary for the resolution of problems.

1.3.Context and importance of this course in the degree

Within the framework of the Master's Degree in Industrial Chemistry, the course "Management Systems and Environmental Legislation" deals with concepts and professional tools that complement other more specific subjects. It is a basic of current principles in Industrial Chemistry and it presents a wide diversity of concepts and referential aspects.

1.4.Activities and key dates

Specific activities, such as work public exposition and discussion will be communicated in advance .They will take place throughout the course will be communicated to the students well in advance.
The global evaluation exams will take place on the dates determined in the calendar of the Faculty of Sciences (consult the bulletin board or the web page http://ciencias.unizar.es/web/horarios.do)

2.Learning goals

2.1.Learning goals

- Have an overview of the requirements of the different standard management systems in the business world and the methodology to be followed in their documentation, implementation, and subsequent certification. Also, the tools used by the company in order to ensure compliance with legal requirements to justify, the activities of the most widespread standards of management systems, as well as the standards that establish the requirements of such systems.

They will be prepared to justify the activities of the most widespread standards of management systems.
They will be trained to analyze the different environmental regulations at International, European and National levels.
They will be able to differentiate between quality models that are applied in the laboratory from models applied to the management systems.

2.2.Importance of learning goals

They will allow us to understand the principles of the environmental standards that affect the chemical sector, distinguishing the nature of the different applicable regulations.
It would be possible to analyze and justify the application of environmental regulations to the chemical sector.
The results of the learning obtained in the subject are necessary to manage the laboratories according to the most important principles and norms. In a context of great technological development, the current needs for demonstration of quality and reliability are evident.

3.Aims of the course and competences

3.1.Aims of the course

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Recognize and design the content of the main technical documents of a Quality Management System. Environmental Management and PRLL Management.
Recognize the applicable legislation in Environmental and Risk Prevention matters.
To have a general knowledge of the principles on which the Standardized Quality Management Systems are based in the test laboratories.
Provide specific training in the field of Environmental Law applied to the field of Chemistry.
Encourage reflection and debate on the scope and limits of the Law that regulates the Environment applied to the field of Chemistry

3.2.Competences

Recognize the impact of chemical products and processes in the Environment and propose methods to evaluate and reduce it.
Know, implement and develop management systems in the company.
Apply existing legislation on the use of chemical substances and preparations.
Develop a complex work in the environment of Industrial Chemistry, participating in the stages of bibliographic search, planning, obtaining results and interpretation and dissemination of them.
Master the technical and management tools for research and development of processes, products and services in the chemical and related industries, including skills in knowledge management and ability to develop and apply original ideas and to lead projects.
Knowledge that provides a basis or opportunity to be original in the development and / or application of ideas, often in a research context.
Know how to apply the knowledge and problem-solving skills in new or unfamiliar environments within broader (or multidisciplinary) contexts related to your area of study.
Being able to integrate knowledge and face the complexity of making judgments from information that, incomplete or limited, includes reflections on social and ethical responsibilities linked to the application of their knowledge and judgments.
Know how to communicate their conclusions and the latest knowledge and reasons that support them to specialized and non-specialized audiences in a clear and unambiguous way.
Have the learning skills that allow them to continue studying in a way that will be largely self-directed or autonomous.
Manage, discriminate and select sources of bibliographic information.
Effectively use information and communication technologies as a working tool.
Use scientific English to obtain information and transfer it.
Manage quality according to ISO 9001.
Manage environmental aspects according to ISO 14001.
Manage health and safety according to OSHAS 18001.
Manage chemical and material testing laboratories according to ISO 17025.
Address other documented and / or standardized management systems.
To know the environmental legal norm in its more general aspects. To deepen in the aspects related to the environmental impact of the products and processes studied.
Know the legal regulations related to occupational safety in its more general aspects. To deepen in the aspects related to the prevention of risks and labor security of the products and processes studied.
Have advanced knowledge about the REACH and CLP regulations.

4.Assessment (1st and 2nd call)

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

Evaluation through the resolution of cases throughout the course
25% of final grade: qualification 1
Evaluation of a work-report based on the application of the principles of the subject in real areas and carried out by each of the students.
25% of final grade: q 2
Evaluation by means of the accomplishment of a written test on the contents of the subject in the call of exams of the

global evaluations
50% of final grade: q 3
In the periods of global exams, the student will be evaluated of all those activities that have not passed satisfactorily during the course
Note 4
The final grade can be obtained considering:
I) progressive notes: final score = 025xqa1 + 0.25xq2 + 0.50xq3
Ii) scores of the global exams: final score = 0.50xq3 + 0.50xq4
The number of official examinations to which the enrollment gives right (2 by matriculation) will be in accordance with the Regulation of official titles adapted to the European Space of Higher Education in the University of Saragossa and the Regulation of Evaluation of the University of Saragossa. The latter will also adjust the general criteria for the design of the tests and the qualification system and, according to it, the schedule, place and date of the review will be made public when the grades are published.
According to the Regulation of Learning Evaluation Rules of the University of Zaragoza, the student will have the right to a global test in which the competences developed in the subject will be evaluated. This global test will be done on the date scheduled by the examination schedule of the Faculty of Sciences.

5.Methodology, learning tasks, syllabus and resources

5.1.Methodological overview

The methodology followed in this course is oriented towards achievement of the learning objectives. A wide range of teaching and learning tasks are implemented, such as:

- Lectures: They will show the overviews of theoretical principles, emphasizing the structure of knowledge.
- Practice sessions: They will focus on structuring problems, choosing - selecting methods. Solving, justifying, interpreting results.
- Presentation and discussion of at least one work done by the students on the recognition and implementation of some of the principles of this course in real organizations/companies.

5.2.Learning tasks

The course includes the following learning tasks:

- Lectures (20 hours). Class attendance: 100%.
- Practice sessions (20-30 hours). Class attendance: 100%. Discussion and sharing of the solutions of the practical cases proposed by the teacher.
- Discussion of students' case studies (10-20 hours). Class attendance: 100%. Discussion of real cases done by the students.

5.3.Syllabus

The course, **Management Systems and Environmental Legislation,** will address the following topics:

Topic 1. Basis of management systems

1. Scope.
2. Standards, rules and Law.
3. Standardization, certification, accreditation.
4.

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Manual, Procedures and Records.

5. Auditing.
6. Process Management.
7. Practical exercises.

Topic 2. Quality management

1. a. History of quality management.
2. b. Statistics.
3. c. ISO 9001 Standard.
4. d. Deployment and certification.
5. e. Practical exercises.

Topic 3. Environmental management systems

1. a. Legal regulations.
1. i. Air quality and Noise
2. ii. Water
3. iii. Soil
4. iv. Waste
5. v. Integrated environmental control model
2. b. Administrative procedure.
3. c. ISO 14001 standard.
4. d. The EMAS management instrument.
5. e. The EU Ecolabel.
6. f. Practical exercises.

Topic 4. Occupational health and safety management systems

1. The history of the Occupational safety.
2. Legal regulations.
3. Occupational Health and safety integration.
4. Work-related Harm.
    1. Work-related Injuries
        1. Machines
        2. Products
        3. Facilities

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4. Activities

2. Work-related disease/illness
    1. Occupational health
    2. Ergonomics
    3. Psycho-sociology applied

5. Occupational Health and safety risk management.
    1. Legal requirements
    2. OHSAS 18001
    3. Practical exercises

Topic 5. Quality Management in the laboratory

1. Uncertainty, calibration, traceability and standards.
2. Good laboratory practices: GLP.
    1. Origins and implementation fields
    2. Principles: Quality assurance, control and evaluation
    3. The Model: chapters
    4. Assessment
    5. The QA unit
3. The Standard ISO 17025.
    1. Origin and implementation fields
    2. Assessment and accreditation activities
    3. Contents: management and technical requirements

4. Comparison with other models: ISO 900 and GLP

4. Interlaboratory tests.
    1. Definition. Types
    2. Results assessment
    3. The Standard ISO 17043
5. Exercises

Topic 6. European Union (EU) and Environmental Law

1. Environmenal Legal Concept. Environmental International Law. EU Environmental Law.
2. Programmes of Action. The European Agency of Environmental Law.
3. Principles of the EU Environmental Law. Public and privates agents of environmental protection.
4. The Right to a Healthy Environment as a Human Right and Chemicals.

Topic 7. Chemicals Legislation

1. REACH Regulations: General Overview. REACH Regulations: Registration. Evaluation. Authorisation. Restrictions. Information. The European Chemicals Agency (ECHA).
2. CLP Regulation: Classification, Labelling. Packaging of substances and mixtures. Nanomaterials.
3. Chemicals, Environment and Consumer Protection. Food products. Medicines.
4. Chemicals, Environment and Industry. Biotechnology.
5. Hazardous substances. Seveso Directives. Carcinogens.
6. Chemicals, Environment and Agriculture. Pesticides. Biocidal Products Legislation.
7. Dioxins, Furans, Polychlorinated biphenyls and Health.
1. The Ambient Air Quality. Volatile Organic compounds. Persistent Organic pollution.
2. EU Waste legislation. Medical Waste.
3. Exportation and importation of Chemicals.

5.4.Course planning and calendar

Further information concerning the timetable, classroom, assessment dates and other details regarding this course, will be provided on the first day of class or please refer to the Faculty of Science http://ciencias.unizar.es/, http://ciencias.unizar.es/web/horarios.do as well as the bulletin board of the Department of Analytical Chemistry.

5.5.Bibliography and recommended resources

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