VNIVERSITAT DE VALÈNCIA

Course Guide
44429 Comprehensive management of quality, safety and innovation

COURSE DATA

Data Subject	
Code	44429
Name	Comprehensive management of quality, safety and innovation
Cycle	Master's degree
ECTS Credits	4.5
Academic year	2020 - 2021

Study (s)

Degree	Center	Acad. year	Period
2209 - M.D. in Chemical Engineering	School of Engineering	1	First term

Subject-matter

Degree	Subject-matter	Character
2209 - M.D. in Chemical Engineering	2 - Comprehensive management of quality, safety and innovation	Obligatory

Coordination

Name	Department
BADIA VALIENTE, JOSE DAVID	245 - Chemical Engineering
BELTRAN TAURA, PAULA	245 - Chemical Engineering
MARTINEZ SORIA, VICENTE	245 - Chemical Engineering

SUMMARY

4.5 ECTS compulsory subject in the first semester of the Master in Chemical Engineering, which is taught in Spanish. This course is part of the management and production optimization and sustainability module. It consists of 3 distinct thematic blocks in which the course is structured: Quality management, industrial safety and occupational risk prevention and management innovation.

The course contents are summarized as: quality, environment, PRL, quality management: business management standard scopes. Implementation and management system audits. Main risks and prevention measures. Implementing regulations. Industrial management and job security. Assessment and risk analysis. Prevention management. Safety in chemical plants. Preparation of technical reports and scientific papers. Project management of technological innovation. Sources of information and funding R + D + I. Strategy for protection and exploitation of R + D + I.

PREVIOUS KNOWLEDGE

Relationship to other subjects of the same degree

There are no specified enrollment restrictions with other subjects of the curriculum.

Other requirements

Some prior basic knowledge is recommended on the principles of quality, safety and prevention of occupational risks.

OUTCOMES

2209 - M.D. in Chemical Engineering

- Students should apply acquired knowledge to solve problems in unfamiliar contexts within their field of study, including multidisciplinary scenarios.
- Students should be able to integrate knowledge and address the complexity of making informed judgments based on incomplete or limited information, including reflections on the social and ethical responsibilities associated with the application of their knowledge and judgments.
- Students should demonstrate self-directed learning skills for continued academic growth.
- Students should possess and understand foundational knowledge that enables original thinking and research in the field.
- Lead and define multidisciplinary teams which can make technical changes and address managerial needs in both national and international contexts.
- Conceive, plan, calculate and design processes, equipment, industrial facilities and services in the field of chemical engineering and other related industrial sectors in terms of quality, safety, economics, rational and efficient use of natural resources and environmental conservation.
- Lead and manage, both technically and economically, projects, facilities, plants, companies and technological centres in the field of chemical engineering and related industrial sectors.
- Conduct proper research, undertake the design and lead the development of engineering solutions in new or unfamiliar environments by linking creativity, originality, innovation and technology transfer.
- Be able to analyse and synthesise for the continued progress of products, processes, systems and services while applying criteria of safety, affordability, quality and environmental management.
- Integrate knowledge and handle the complexity of formulating judgments and decisions, based on incomplete or limited information, which take account of the social and ethical responsibilities of professional practice.
- Communicate and discuss proposals and conclusions in specialised and non-specialised multilingual forums, in a clear and unambiguous manner.

- Adapt to changes and be able to apply new and advanced technologies and other relevant developments with initiative and entrepreneurship.
- Have skills for independent learning in order to maintain and enhance the specific competences of chemical engineering which enable continuous professional development.
- Be able to access information tools in different areas of knowledge and use them properly.
- Be able to assess the need to complete their technical, scientific, language, computer, literary, ethical, social and human education, and to organise their own learning with a high degree of autonomy.
- Be able to defend criteria with rigor and arguments and to present them properly and accurately.
- Be able to take responsibility for their own professional development and specialisation in one or more fields of study.
- Lead and organise companies and production and service systems by applying knowledge and skills of industrial organisation, business strategy, planning and logistics, mercantile and labour regulations, and financial and cost accounting.
- Lead and manage the organisation of work and human resources by applying criteria of industrial safety, quality management, risk prevention, sustainability and environmental management.
- Manage research, development and technological innovation taking into account the transfer of technology and the property and patent rights.
- Manage and perform verification and control of facilities, processes and products, as well as certifications, audits, inspections, tests and reports.
- Adapt to structural changes in society caused by economic, energy or natural factors or phenomena in order to solve resulting problems and provide technological solutions with a high commitment to sustainability.

LEARNING OUTCOMES

- To gain knowledge about quality management.
- To understand the operation of the systems management standardized quality.
- To learn the basic principles of audits as a management tool.
- To learn the basics of safety in industrial processes and complementary industrial facilities that serve these processes.
- To know and apply the legal regulations on industrial safety and prevention of occupational hazards, in particular, know and manage all the required legal documents to companies and organizations.
- To be able to apply the principles of preventive actions in both industrial projects and their exploitations.
- To know which are the agencies/institutions related to industrial safety, occupational risk prevention, quality and R & D
- To be able to develop a scientific / technical report.
- To understand the keys of managing technological innovation projects.
- To know the various forms and sources of funding for R + D + i. To acquire basic knowledge about the protection and exploitation of intellectual property, scientific and technological dissemination and transfer of technology

DESCRIPTION OF CONTENTS

1. Quality management

1. Basic Principles of Quality, management quality and management systems.
2. Introduction to management systems: ISO 9001 and 14001. Structure HLS. Benefits of Management Systems. Continuous improvement and process management. Implementation and certification. Documentation.
3. Management systems ISO 9001- ISO 14001: Standard requirements. Elements.

2. Industrial safety and occupational risk prevention

1. Basic principles of industrial and occupational safety. Basic legislation and key regulatory aspects. The Plan of Occupational Risks.
2. Techniques of control. Inspections security. Planned observations. Management of accidents. Documentation. Safety in chemical plants.
3. Regulatory Audits Prevention System. Legal bases. Auditing techniques. The administrative control. Risk assessment and analysis.

3. Innovation management at chemical engineering

1. Innovation. Applied innovation. Tools for an innovation project.
2. Programmes of reseach, development and innovation (R+D+I). Public financing programmes. Preparation of proposals for the European Commision through the H2020 programme.
3. Communication and diffusion of R+D+I results. Diffusion and dissemination. Diffusion resources. Structure of a scientific-technical report.
4. Protection and exploitation of R+D+I results. How to protect your knowledge. Structure of R+D+I Contracts.

WORKLOAD

ACTIVITY	Hours	% To be attended
Theory classes	30,00	100
Classroom practices	15,00	100
Development of group work	14,00	0
Development of individual work	22,50	0
Study and independent work	20,00	0
Preparation of evaluation activities	6,00	0
Preparation of practical classes and problem	5,50	0
TOTAL	**113,00**	

TEACHING METHODOLOGY

The course will be developed through lectures and practical classes.

Classroom sessions: through participatory lectures, the main concepts will be developed to provide a comprehensive and integrated vision, analysing in detail the key and most complex aspects, promoting, at all times, student participation. Adequate resources for further preparation of the subject in depth by the student will be also recommended.

Practical activities: The practical sessions will complement the theoretical activities in order to apply the basics, and expand the knowledge and experience that the students acquired during the fulfilment of the proposed work. This will be done in the classroom or in small groups. The following types of classroom activities are included:

- Classes of exercises and questions in the classroom. The teacher will explain a number of standard exercises, which allow students to acquire the necessary skills to analyse, formulate and solve the problems of each subject. Some problems will be solved in practical sessions in small groups.
- Sessions for discussion and resolution of exercises. In these sessions the students will analyse and discuss a series of exercises or work previously posed by the teacher. These sessions will be conducted in small groups.
- Innovation project developed for students.

Practices in the computer classroom. In these sessions, students will use the commercial softwares. These sessions will be conducted in small groups.

For the development of all these activities, both students and the teacher will use the “Aula Virtual” platform. An schedule will be proposed for the student works.

EVALUATION

The assessment of student learning will be carried out by

50% of the mark corresponds to the evaluation of the works. The remaining 50% will correspond to tests score. It will be a minimum requirement to pass the subject further from 4.5 in the exams.

The works of the innovation section will not be recoverable.

REFERENCES

Basic

- Técnicas de Prevención de Riesgos Laborales, J. M. Cortés Díaz, Tebar, 2003
- Gestión de la calidad y gestión medioambiental. Claver Cortés, Enrique; Molina Azorín, José Francisco; Tarí Guilló, Juan José. Ed. Pirámide
- Gestión de la Calidad, Editorial AENOR. Gestión ambiental, Editorial AENOR
- Dirección estratégica de la innovación tecnológica
  Schilling, Melissa A | Madrid etc. : McGraw-Hill/Interamericana de España, cop. 2008. | [2ª ed.]
- Ayudas a la I+D+i del Gobierno Español . URL: http://www.idi.mineco.gob.es/portal/site/MICINN
- Ayudas a la I+D+i de la Comision Europea. URL: http://www.eshorizonte2020.es/
  Normativa Oficina Española de Patentes y Marcas. URL: http://www.oepm.es/es/propiedad_industrial/Normativa/normas_sobre_proteccion_de_invenciones/
- Prevención de riesgos laborales E. Lefebvre 2019. Agiló Crespí P. y otros.,
- Deploying the integrated management system : quality, environment, and health and safety [ISO 9001, ISO 14001, OHSAS 18001] : self-assessment work book : 59 probing questions and contrasting pairs of examples : what separates the successful from the average? / Jussi Moisio, Kari Tuominen ;
- ISO 9001 Quality Management Systems Springer 2017. D. Natarajan

Additional

- Manual de seguridad industrial en plantas químicas y petroleras. Mc Graw Hill. J.M. Storch de Gracia.
- Análisis y reducción de riesgos en la industria química. Fundación MAPFRE. J.M. Santamaría Ramiro, P.A. Braña Aísa.
- Sistemas de gestión de riesgos laborales e industriales. Fundación MAPFRE. Germán Burriel LLuna.
- Manual para la Prevención de Riesgos Laborales, G. López Etxebarría, CISS PRAXIS, 2001

ADDENDUM COVID-19

This addendum will only be activated if the health situation requires so and with the prior agreement of the Governing Council

Contents

The contents initially included in the teaching guide are maintained.

Volume of work and temporary planning of teaching

Regarding the workload:

The different activities described in the Teaching Guide are maintained with the planned dedication.

Regarding the temporary planning of teaching

The material for the follow-up of the theory/practical lessons allows to continue with the temporary teaching schedule both in days and hours, both if teaching is conventional face-to-face classroom-based or not.

Teaching methodology

Theory and practical lessons will tend to the maximum possible attendance, always respecting the sanitary restrictions (50% of usual classroom capacity). Depending on the capacity of the classroom and the number of students enrolled, it may be necessary to distribute the students into two groups. In this case, the subject will be taught in classrooms with streaming teaching capacity, and there may be students attending online and in class. A rotation system will be established once the enrolment data is known, guaranteeing, in any case, that the attendance percentage of all the students enrolled in the subject is the same.

Once the enrolment data is available and the availability of spaces is known, the Academic Committee of the Master will approve the Teaching Model of the Máster and its adaptation to each subject, establishing the specific conditions in which it will be taught.

If there is a closure of the facilities for health reasons that totally or partially affects the classes of the subject, these will be replaced online sessions following the schedules established by synchronous video conferencing, or, if not possible, asynchronous.

Evaluation

The evaluation system described in the Teaching Guide of the subject in which the different evaluable activities have been specified as well as their contribution to the final mark of the subject is maintained.

If there is a closure of the facilities for health reasons that affect the development of any face-to-face evaluable activity of the subject, it will be replaced by a test of a similar nature that will be carried out in virtual mode using the computer tools licensed by the University of Valencia. The contribution of each evaluable activity to the final mark of the subject will remain unchanged, as established in this guide.

Bibliography

The bibliography recommended in the Teaching Guide is kept as it is accessible and is complemented with notes, slides and problems uploaded to the Virtual Classroom as subject material