COURSE DATA

Data Subject	
Code	34210
Name	Chemistry projects
Cycle	Grade
ECTS Credits	6.0
Academic year	2019 - 2020

Study (s)

Degree	Center	Acad. year	Period
1110 - Degree in Chemistry	Faculty of Chemistry	4	First term

Subject-matter

Degree	Subject-matter	Character
1110 - Degree in Chemistry	11 - Chemical Industry	Obligatory

Coordination

Name	Department
CERISUELO FERRIOLS, JOSEP PASQUAL	245 - Chemical Engineering

SUMMARY

Chemical Projects is a component of Chemical Company, the overall objective of which is to teach students how to design, develop and evaluate projects and reports in the field of Chemistry by applying their knowledge of methodology and the basic principles of economics, management, auditing and organisation. This compulsory 6 ECTS credit course is taught in the second semester of the fourth year of the Degree in Chemistry.

The objectives of the course are:

- to enable students to successfully manage any type of real project in the field of Chemical Sciences.

- to know the general theory of project management and justify this approach vis-a-vis a procedural management approach within an organisation in the chemical industry.

- to know the phases in the life cycle of a chemical project.

- to explain the characteristics needed for technical reports and other documents for presenting and defending projects, etc.

- to know the feasibility techniques for chemistry projects.

- to learn the techniques for the financial evaluation of chemistry projects.

- to learn the techniques for the planning and control of chemistry projects.

- to understand the relationship between the technical issues to be addressed in a project and an organization's strategic plan.

- to know the context of project management in chemistry from the perspective of risk and quality.

This course has a practical educational approach since it primarily focuses on developing students' practical engineering skills for application in their careers as project managers or as part of a team. By achieving these objectives, students will acquire numerous skills for managing material and human resources when planning and delivering any chemical project.

PREVIOUS KNOWLEDGE

Relationship to other subjects of the same degree

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

Other requirements

Due to the general nature of this course, no specific prior knowledge is required. However, it is recommended that students will first have completed Computer Applications in Chemistry and Chemical Engineering to gain a perception of the more industrial aspects of Chemical Sciences.

OUTCOMES

1108 - Degree in Chemistry

- Demonstrate leadership and management skills, entrepreneurship, initiative, creativity, organization, planning, control, leadership, decision making and negotiation.
- Demonstrate ability to work in teams both in interdisciplinary teams and in an international context.

- Demonstrate ability to communicate information, ideas, problems and solutions to both specialist and non-specialist audiences and using information technology, as appropriate.
- Demonstrate a commitment to ethics, equality values and social responsibility as a citizen and as a professional.
- Demonstrate the ability to adapt to new situations.
- Recognise and analyse new problems and plan strategies to solve them.
- Relate chemistry with other disciplines.
- Prepare reports, surveys and industrial and environmental projects in the field of chemistry.
- Students must have the ability to gather and interpret relevant data (usually in their field of study) to make judgements that take relevant social, scientific or ethical issues into consideration.
- Students must be able to communicate information, ideas, problems and solutions to both expert and lay audiences.
- Students must have developed the learning skills needed to undertake further study with a high degree of autonomy.
- Express oneself correctly, both orally and in writing, in any of the official languages of the Valencian Community.

LEARNING OUTCOMES

The previous section includes the competences contained in the document VERIFICA. This subject addresses part of the learning results of the matter Projects in Chemistry that allow to acquire specific knowledge of chemistry, cognitive skills and general skills recommended by the EUROPEAN CHEMISTRY THEMATIC NETWORK (ECTN) for the Chemistry Eurobachelor® Label. The following table lists the learning outcomes acquired in the subject Projects in Chemistry related to the competences of the degree in Chemistry.

COMPETENCES AND COGNITIVE SKILLS	
The learning process should allow the degree graduates to demonstrate:	
	Competences of the subject Projects in Chemistry that contemplate the learning outcomes EUROBACHELOR®
Ability to demonstrate knowledge and understanding of the facts, concepts, principles and fundamental theories related to the topics mentioned above.	Demonstrate knowledge and understanding of essential facts, concepts, principles and theories related to the areas of chemistry..(CE13).

Ability to apply this knowledge and understanding to the solution of common qualitative and quantitative problems.	Solve qualitative and quantitative problems following previously developed models..(CE14). Recognise and analyse new problems and plan strategies to solve them..(CE15). Understand the qualitative and quantitative aspects of chemical problems..(CE24).
Competences for the evaluation, interpretation and synthesis of information and chemical data.	Evaluate, interpret and synthesise chemical data and information..(CE16). Interpret data from observations and measurements in the laboratory in terms of their significance and the theories that underpin them..(CE20).
Ability to recognize and implement science and the practice of measurement.	Show knowledge of the metrology of chemical processes including quality management..(CE10) Interpret data from observations and measurements in the laboratory in terms of their significance and the theories that underpin them..(CE20).
Ability to calculate and process data, related to information and chemistry data.	Solve qualitative and quantitative problems following previously developed models..(CE14). Recognise and analyse new problems and plan strategies to solve them..(CE15).

COMPETENCES AND COGNITIVE SKILLS RELATED TO THE PRACTICE OF CHEMISTRY	
The learning process should allow the degree graduates to demonstrate:	
	Competences of the subject Projects in Chemistry that contemplate the learning outcomes EUROBACHELOR®
Ability to perform risk assessments of the use of chemical substances and laboratory	Understand the qualitative and quantitative aspects of chemical problems..(CE24).

procedures.	Develop sustainable and environmentally friendly methods.(CE25). Evaluate the risks in the use of chemicals and laboratory procedures..(CE21).

GENERAL COMPETENCES	
The learning process should allow the degree graduates to demonstrate:	
	Competences of the subject Projects in Chemistry that contemplate the learning outcomes EUROBACHELOR®
Ability to apply practical knowledge to solve problems related to qualitative and quantitative information.	Solve problems effectively..(CG4). Solve qualitative and quantitative problems following previously developed models..(CE14). Relate theory and experimentation..(CE22). Recognise and evaluate chemical processes in daily life..(CE23). Understand the qualitative and quantitative aspects of chemical problems..(CE24).
Competences in information management, in relation to primary and secondary sources, including information retrieval through on-line searches.	Demonstrate ability to communicate information, ideas, problems and solutions to both specialist and non-specialist audiences and using information technology, as appropriate..(CG6).

	Have basic skills in the use of information and communication technology and properly manage the information obtained.(CT2).
Ability to analyse materials and synthesize concepts.	Develop capacity for analysis, synthesis and critical thinking.. (CG1). Show inductive and deductive reasoning ability..(CG2). Students must have the ability to gather and interpret relevant data (usually in their field of study) to make judgements that take relevant social, scientific or ethical issues into consideration..(CB3).
Ability to adapt to new situations and make decisions.	Demonstrate the ability to adapt to new situations..(CG9). Recognise and analyse new problems and plan strategies to solve them..(CE15). Students must have the ability to gather and interpret relevant data (usually in their field of study) to make judgements that take relevant social, scientific or ethical issues into consideration..(CB3).
Skills related to information technology such as word processing, spreadsheet, recording and storage of data, internet use related to the subjects.	Demonstrate ability to communicate information, ideas, problems and solutions to both specialist and non-specialist audiences and using information technology, as appropriate..(CG6). Have basic skills in the use of information and communication

	technology and properly manage the information obtained.(CT2).
Planning and time management skills.	Develop capacity for analysis, synthesis and critical thinking. (CG1). Demonstrate leadership and management skills, entrepreneurship, initiative, creativity, organization, planning, control, leadership, decision making and negotiation..(CG3). Solve problems effectively..CG4).
Interpersonal skills to interact with other people and get involved in team work.	Demonstrate ability to work in teams both in interdisciplinary teams and in an international context..(CG5). Demonstrate a commitment to ethics, equality values and social responsibility as a citizen and as a professional. (CG7). Demonstrate the ability to adapt to new situations..(CG9).
Competences in oral and written communication, in one of the main European languages, in addition to the language of the country of origin.	Demonstrate ability to work in teams both in interdisciplinary teams and in an international context..(CG5). Demonstrate a commitment to ethics, equality values and social responsibility as a citizen and as a professional. (CG7). Express oneself correctly, both orally and in writing, in any of the official languages of the Valencian Community. (CT1). Students must be able to

	communicate information, ideas, problems and solutions to both expert and lay audiences..(CB4). Have basic skills in the use of information and communication technology and properly manage the information obtained.(CT2).
Study skills necessary for professional development. These will include the ability to work autonomously.	Demonstrate leadership and management skills, entrepreneurship, initiative, creativity, organization, planning, control, leadership, decision making and negotiation..(CG3). Demonstrate ability to work in teams both in interdisciplinary teams and in an international context..(CG5). Learn autonomously.(CG8). Demonstrate the ability to adapt to new situations..(CG9). Students must have developed the learning skills needed to undertake further study with a high degree of autonomy.(CB5).
Ethical commitment to the European Code of Conduct: http://ec.europa.eu/research/participants/data/ref/h2020/other/hi/h2020-ethics_code-of-conduct_en.pdf	Acquire a permanent sensitivity to quality, the environment, sustainable development and the prevention of occupational hazards.(CG10). Demonstrate a commitment to ethics, equality values and social responsibility as a citizen and as a professional. (CG7). Students must have the ability to gather and interpret relevant data (usually in their field of study) to make judgements that take

	relevant social, scientific or ethical issues into consideration. (CB3).

DESCRIPTION OF CONTENTS

1. Competencies and Professional Practice of the Graduate in Chemistry

1.1. Competencies of the graduate in Chemistry.
1.2. Professional practice of the graduate in Chemistry.
1.3. Quality management and risk management.

2. Introduction to Project Management

2.1. Introduction to the theory of projects
2.2. Phases of a project and areas of expertise; the life cycle of a Chemistry project
2.3. Managing the scope of a project
2.4. Time management
2.5. Cost management
2.6. Risk management
2.7. Managing resources

3. Financial Management of a Project

3.1. Definition and classification of costs.
3.2. Economic indicators for evaluating a project

4. Preparing and Documenting a Project

4.1. Introduction.
4.1.1. The importance of documentation
4.1.2. Classical document division
4.1.3. Criteria for managing documents
4.2. Structure of a classical project
4.2.1 Technical-Descriptive Report
4.2.2 Specification
4.2.3 Budget
4.2.4 Annexes
4.3. Documents in project management
4.3.1 Definition and description
4.3.2 Documents present in project planning
4.3.3 Documents for controlling and monitoring projects

WORKLOAD

ACTIVITY	Hours	% To be attended
Theory classes	41,00	100
Computer classroom practice	12,00	100
Tutorials	7,00	100
Development of group work	15,00	0
Development of individual work	10,00	0
Study and independent work	10,00	0
Readings supplementary material	5,00	0
Preparation of evaluation activities	15,00	0
Preparing lectures	10,00	0
Preparation of practical classes and problem	15,00	0
Resolution of case studies	10,00	0
TOTAL	**150,00**	

TEACHING METHODOLOGY

The development of the subject is structured around four axes: learning with the teacher (theory sessions, problems and face-to-face tutorials), seminars-workshop, laboratory sessions and the realization of a project fulfilling all the Its stages, from the planning phase to the final realization of the project document.

Group learning with the teacher

In the theory sessions, the master class model will be used. The teacher will present the fundamental contents of the subject, using the audiovisual media available to them (presentations, transparencies, slate).

In sessions problems, the teacher will explain a number of types-problems.

Laboratory sessions

The laboratory sessions have the objective:

-Learning and management of project management tools

- Make a spreadsheet in the representation of the scope of a project (EDT / WBS) as well as the study of its exploitation and economic viability account.

Conduct a project (group work)

Students belonging to the same group of group tutorials will train teams

They will have to prepare a project that addresses content included in any of the areas of knowledge included in the field of chemistry, fulfilling all its stages, from the planning phase to the final realization of the project document and its presentation.

EVALUATION

The knowledge acquired by the student will be assessed as follows:

1) System of continuous evaluation (first call)

2) Unique evaluation system (second call)

1) System of continuous evaluation

This is the method that will be recommended to students as a mechanism for evaluating the contents of the subject. By means of this system the participation of the students in the aprovechamiento of formative activities and the implication of these in the learning process will be evaluated of regular form. It is the system obligatorily used in the first call.

The following aspects will be assessed:

a) Individual objective test: consisting of a global examination of the subject, or proof of knowledge, which consist of both theoretical and practical issues (NEX).

b) Group project: above all, the implication and performance shown by the student will be assessed in the group activity of carrying out a complete project (NP).

c) Practical sessions in the computer classroom: the implication and delivery of the exercises proposed (NL) will be assessed.

In order to make an average of the marks of the different categories, a minimum score of 5 points (out of 10) will be requested in each one of them.

Rating = 40% NEX + 40% NP + 20% NL

Single evaluation system

This method will be applied in the second call. Then, the qualification will be obtained from 70% of the mark obtained in a single global examination of the subject and 30% of the group project activity, that would have had to be realized during the course of the classes and that was evaluated in first call. The completion of this global exam will coincide (in the case of the first call) with the final examination of the theory of the students who have continued the system of continuous evaluation.

This unique global examination will include the contents of both the theory sessions, as well as the practical sessions and the computer lab.

In this evaluation system it is necessary to obtain a minimum score of 5 points (out of 10) in the overall exam of the subject.

General considerations

If it is detected that a student has copied or plagiarized any of the assessment activities, or that he / she has not respected the established norms in this respect, he / she will be able to obtain the qualification of fail for the full evaluation and the academic authority will be notified so that it proceeds to adopt the sanctioning measures that are considered appropriate.

Apart from the aforementioned activities, the course also includes the participation of students in a conference related to the subjects taught. This conference will be scheduled throughout the course during school hours, and attendance will be mandatory to pass the course.

As a result of the evaluation of each student, their evaluation will be in accordance with the Regulations of qualifications of the University of Valencia. At the time of writing of this teaching guide, the current regulations are those approved by the Governing Council of the UVEG of January 27, 2004, which is in accordance with the provisions established by Royal Decrees 1044 / 2003 and 1125/2003. In this norm basically it is established that the grades will be numerical from 0 to 10 with the expression of a decimal, and which must be added the corresponding qualification corresponding to the following scale:

From 0 to 4.9: "Failed"

From 5 to 6.9: "Approved"

From 7 to 8.9: "Remarkable"

From 9 to 10: "Excellent"

REFERENCES

Basic

- PROJECT MANAGEMENT INSTITUTE, A Guide to the Project Management Body of Knowledge, 4a edició,Project Management Institute (2008), ISBN: 19-33890517

- DOMINGO AJENJO, A., Dirección y Gestión de Proyectos, un enfoque práctico. Editorial Rama, (2005).ISBN: 9701511301.
- CABRA, L., DE LUCAS A., RUIZ, F. y RAMON M.J, Metodologías del diseño aplicado y gestión de proyectos para ingenieros químicos. Ediciones de la Universidad de Castilla La Mancha. 2010. ISBN:9788484277583
- GIMENEZ, A. Diseño de Procesos en Ingeniería Química. Editorial Reverte. 2003: 8429172777

Additional

- PEREÑA, J. Dirección y Gestión de Proyectos. Editorial Díaz de Santos (1991). ISBN: 8479782498
- GRASHINA M.N y NEWELL M.W, Preguntas y Respuestas Sobre La Gestión de Proyectos, Editorial Gestión 2000, (2005). ISBN: 9788480886864
- GOMEZ, J. F y CORONEL, A.J; MARTINEZ DE IRUJO y LORENTE, A. Gestión de proyectos. FC Editorial. Madrid, (2000). ISBN: 84-28317747.

ADDENDUM COVID-19

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

English version is not available