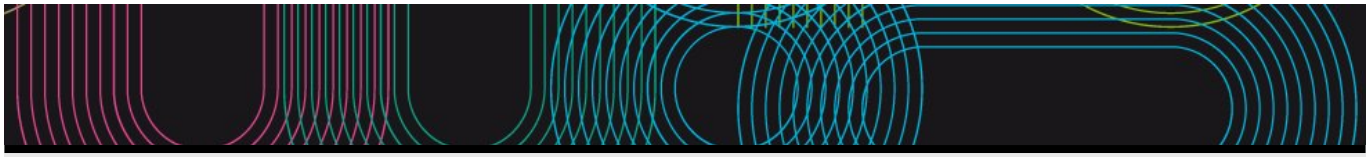

IDENTIFYING DATA				
Design of chemical and processing plants				
Subject	Design of chemical and processing plants			
Code	V12G350V01914			
Study programme	Degree in Industrial Chemical Engineering			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Optional	4th	2nd
Teaching language	Spanish Galician			
Department				
Coordinator	Troncoso Saracho, José Carlos Pose Blanco, José			
Lecturers	Pose Blanco, José Troncoso Saracho, José Carlos			
E-mail	jpose@uvigo.es tsaracho@uvigo.es			
Web				
General description	The *asignatura of Design of Chemical Plants and of Process has like vision and like mission provide to the future Graduated in Engineering in Industrial Chemistry the knowledges, capacities and skills that allow him design, evaluate and implant plants of processed in the field of the chemical engineering. It is a *asignatura of nature *interdisciplinar because it requires of previous knowledges on processes and technologies of transformation of products, constructions and industrial installations; as well as on methodologies of preparation, organisation and management of projects, amongst other. The study of the *asignatura is a fundamental tool to strengthen the knowledges purchased by the *alumnado during the study of the career, from the fundamental appearances of physical chemistry, mathematical, graphic expression, in which they rest the applications of chemical engineering, until the implementation of the same in the preparation of projects of processes and plants of process. To attain it employs a wide approach of the contents of the *asignatura, looking for the integration of the knowledges purchased along the career, by means of the implementation of methodologies of active learning so that the exposed contents in theoretical classes apply in the development of the practical activities, oriented to the industrial reality of the profession, assimilating the agile and precise employment of the distinct rule of application and of the professional best practices established, supporting in the new technologies to document, elaborate, manage the design of processes and plants of process in the professional field of the chemical engineering.			

Competencies	
Code	
B1	CG1 Skills for writing, signing and developing projects in the field of industrial engineering, whose purpose, specializing in Industrial Chemistry, construction, alteration, repair, maintenance, demolition, manufacturing, installation, assembly or operation of: structures, mechanical equipments, energy facilities, electrical systems and electronic installations and industrial plants, and manufacturing processes and automation.
B3	CG3 Knowledge in basic and technological subjects that will enable students to learn new methods and theories, and provide them the versatility to adapt to new situations.
B4	CG4 Ability to solve problems with initiative, decision making, creativity, critical thinking and the ability to communicate and transmit knowledge and skills in the field of industrial engineering specializing in Industrial Chemistry.
B5	CG5 Knowledge to carry out measurements, calculations, assessments, appraisals, surveys, studies, reports, work plans and other similar works.
B6	CG6 Capacity for handling specifications, regulations and mandatory standards.
C18	CE18 Knowledge and skills to organize and manage projects. Know the organizational structure and functions of a project office.

D1	CT1 Analysis and synthesis.
D2	CT2 Problems resolution.
D5	CT5 Information Management.
D6	CT6 Application of computer science in the field of study.
D7	CT7 Ability to organize and plan.
D8	CT8 Decision making.
D9	CT9 Apply knowledge.
D10	CT10 Self learning and work.
D11	CT11 Planning changes to improve overall systems.
D13	CT13 Adaptability to new situations.
D14	CT14 Creativity.
D16	CT16 Critical thinking.
D17	CT17 Working as a team.
D19	CT19 Personal relationships.
D20	CT20 Ability to communicate with people not expert in the field.
D21	CT21 Leadership.

Learning outcomes

Expected results from this subject	Training and Learning Results	
Comprise the basic appearances of general approach that supposes the implantation of a process.	B1 B3	D1 D16
Know and interpret the different normative of forced existent fulfillment concerning the activity.	B6	D1 D5 D6 D8 D13 D20
Develop documents that express the idea of design conceived	B1 B4 B5	D1 D2 D5 D6 D7 D8 D9 D14 D16 D17 D19
Skill for the work in group with aims.	B4	D1 D5 D6 D8 D9 D13 D14 D16 D17 D19
Purchase skills to manage the relative information to the plants of process	B4 B6	D1 D2 D5 D6 D7 D8 D10 D11 D13 D14 D16 D17 D19 D20 D21

Capacity for the design of installations and auxiliary systems in the chemical industry and of process.	B1 B4 B5 B6	C18	D1 D2 D5 D6 D7 D8 D9 D10 D11 D13 D14 D16 D17 D19 D20

Contents	
Topic	
1. Introduction and presentation of the subject.	1.1. Presentation. 1.2. Educational guide of the subject. 1.3. Criteria and norms for the development of the subject.
2. Introduction to the design of of processes and plants of process.	2.1. Introduction 2.2. Design of processes and plants of process 2.3. Bases of the design 2.4. Alternatives of design 2.5. Components of a plant of process 2.6. Phases in the design of plants 2.7. General considerations that take in account in the technical design of a plant.
3. Methodology for the design of plants of process.	3.1. Previous studies 3.2. Selection and design of the productive process. 3.3. Definition of the constructive elements of the building that houses the activity 3.4. Design of the general installations of the plant 3.5. Design of the necessary auxiliary services. 3.6. Security and environment in the design of plants. 3.7. Editorial and documentation of projects of plants of process.
4. Organisation and management of the realisation and start up of a process plant.	4.1. Direction and coordination of projects of process plants. 4.2. Planning, programming and control of the execution of projects of process plants. 4.3. Legal frame that regulates the design and the material execution of industrial plants. 4.4. Administrative and legal management of projects process plant.
Practice 1. Preparation of the planning of the phase of editorial of a project related with a process or a process plant.	Organised the students in groups of three members (two or four exceptionally) will realise the planning, programming and system of control of the phase of editorial of a project related with a process or with a process plant.
Practice 2. Preparation of a technical study or simple project related with a plant of process	Organised the students in groups of three members will develop, according to the level of difficulty, a technical study, a preliminary draft, a subproject or project of detail of a process or of a plant of process.

Planning			
	Class hours	Hours outside the classroom	Total hours
Projects	32	64	96
Presentations / exhibitions	2	6	8
Master Session	18	24	42
Short answer tests	2	0	2
Reports / memories of practice	2	0	2
*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.			

Methodologies	
	Description
Projects	Supporting the methodology of learning by projects and in the methods, technical and tools of management of projects each group realises the planning, programming and system of control of the phase of editorial of a project related with a process or a plant of process.

Presentations / exhibitions	Exhibition by part of the student body in front of the class of the results of the work developed.
Master Session	Participatory masterclass where will expose the aims and the main contents of the temary and will put to disposal of the students all those necessary materials for the development of the practical activities programmed.

Personalized attention

Methodologies	Description
Projects	Proposal of readings and complementary activities for the reinforcement to the learning of the contents of the subject, especially headed to the students that show difficulties to follow of form adapted the development of the tasks programmed.

Assessment

	Description	Qualification	Training and Learning Results		
Short answer tests	Along the quarter will carry out a series of proofs and activities for the continuous evaluation of knowledges	30	B1 B3 B4 B5 B6	C18	D1 D2 D5 D7 D10 D11 D14
Reports / memories of practice	Along the quarter will carry out a series of deliverables of the practical activities for his continuous evaluation by the faculty. It will value also the implication of the student in the classes and in the realisation of the diverse activities programmed, the fulfillment of the terms of delivery and/or exhibition and defence of the works proposed.	70	B1 B3 B4 B5 B6	C18	D1 D2 D5 D6 D7 D8 D9 D10 D13 D14 D16 D17 D19 D20 D21

Other comments on the Evaluation

In the modality of continuous evaluation the students surpass the subject if they reach the punctuation of five points without need to realise the proof of the ordinary announcement. The modality of continuous evaluation will be liberating, having to recover only, so much in the announcement of May as in the one of Julio, those no surpassed parts along the process of continuous evaluation. Also they will be able to present to the official examination complete those who, even having surpassing the matter in the modality of continuous evaluation, wish to modify the qualification obtained. The students that do not surpass the *asignatura in the first announcement will owe to realise a final proof that will contemplate the whole of the contents of the subject, so many theorists like practical, and that it will be able to include proofs of fast answer, resolution of problems and development of practical suppositions. It expects that the present student a suitable ethical behaviour. In the case to detect a no ethical behaviour (copy, plagiarism, utilisation of unauthorised electronic devices, and others) will consider that the student does not gather the necessary requirements to surpass the matter. In this case the global qualification in the present academic course will be of suspense (0.0).

Sources of information

Basic Bibliography

Baquero Franco, J.; Llorente Martínez, V, **EQUIPOS PARA LA INDUSTRIA QUÍMICA Y ALIMENTARIA**, 1985,

Gómez-Senent, E., Gómez-Senent, D., Aragonés, P., Sánchez, M.A. y López, D., **CUADERNOS DE INGENIERÍA DE PROYECTOS I. DISEÑO BÁSICO (ANTEPROYECTO) DE PLANTAS INDUSTRIALES**, 2000,

Jiménez Alcaide, L.; Rodríguez Pascual, A., **EL PROYECTO DE UNA PLANTA QUÍMICA**, 2016,

Perry, R.H.; Green, D.W.; Maloney, JO, **MANUAL DEL INGENIERO QUÍMICO**, 2001,

Rase, F; Barrow, M.H., **DISEÑO DE TUBERÍAS PARA PLANTAS DE PROCESO**, 2001,

Sinnott, R.; Towler, G., **DISEÑO EN INGENIERÍA QUÍMICA**, 2012,

Complementary Bibliography

Recommendations

Subjects that it is recommended to have taken before

Materials science and technology/V12G350V01305
Fundamentals of manufacturing systems and technologies/V12G350V01304
Chemical engineering 1/V12G350V01405
Fluid mechanics/V12G350V01401
Mechanics of materials/V12G350V01404
Control and instrumentation in chemical processes/V12G350V01603
Chemical engineering 2/V12G350V01503
Projects elaboration and management in engineering/V12G350V01604
Industrial chemistry/V12G350V01504
Environmental technology/V12G350V01502

Other comments

Previously to the realisation of the proofs will facilitate normative, manual or any another material that was necessary.

Requirements: To enrol in this matter is necessary to have surpassed or be enrolled of all the matters of the inferior courses to the course in which it is situated this matter.

In case of discrepancies, will prevail the version in Spanish of this guide.