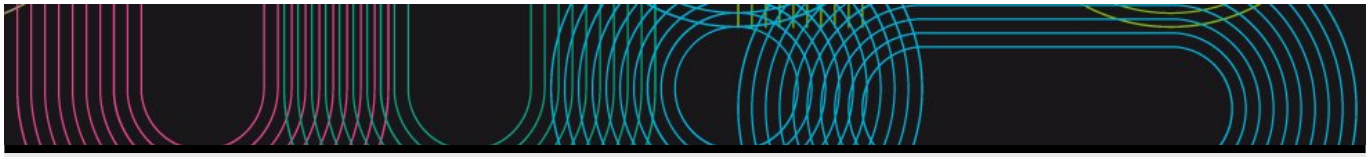

IDENTIFYING DATA				
Industrial installations				
Subject	Industrial installations			
Code	O01G281V01914			
Study programme	Grado en Ingeniería Agraria			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Optional	4th	1st
Teaching language	Galician			
Department				
Coordinator	Rivas Siota, Sandra			
Lecturers	Gullón Estévez, Beatriz Rivas Siota, Sandra			
E-mail	sandrarivas@uvigo.es			
Web				
General description	(*)Nesta materia analizanse a estructura dos procesos industriais, as etapas e aspectos considerados no seu deseño, e aspectos relacionados cas operacións básicas involucradas			

Training and Learning Results	
Code	
A4	Students will be able to present information, ideas, problems and solutions both to specialist and non-specialist audiences.
B2	Students will acquire and apply teamwork abilities and skills.
B3	Students will develop personal skills to engage in critical, constructive thinking.
C38	Ability to understand and use auxiliary equipment and machinery in the food and agriculture industry.
C40	Ability to understand and use concepts linked to the engineering of construction and facilities.
C41	Ability to understand and use concepts linked to food and agriculture facilities.
C42	Ability to understand and use the concepts linked to waste management and exploitation.
D2	Analysis, organization and planning skills.
D3	Oral and written communication skills in local and foreign languages.
D5	Problem-solving and decision-making skills.

Expected results from this subject	Training and Learning Results			
RA1: Specify the stages involved in the design of a processing plant, together with the usual techniques and procedures to carry it out	A4	B3	C38 C41	D5
RA2: Improve the knowledge of unit operations used in an industrial process	A4	B3	C38 C41	D5
RA4: To know the main auxiliary equipment envolved in a food industry	A4	B3	C38	D5
RA5: Ability for the preparation, conception, writing and signing of projects for the construction, installation, supervision or maintenance of a food industry (extractive, fermentative, dairy, canning, fruit and vegetable products, meat, fisheries processes and, in general, any other dedicated to the elaboration and/or transformation, conservation, handling and distribution of food products)	A4	B2 B3	C38 C40 C42	D2 D3 D5

Contents	
Topic	
Introduction	- Chemical/Food processes - Stages for process design - Process simulators - Economics. Process feasibility

Fundamentals of process engineering	- Unit operations - Energy integration
Equipment design and sizing	- Liquid pumping. NPSH - Movement of solids - Agitation and mixture
Auxiliary equipment used in the food industry	- "in situ" cleaning systems. Hygienic design - Steam production - Refrigeration
Study of representative processes employing agro-food based raw materials or related residual streams	- Sugar production. Valorization of the residual pulp - Malt production. Valorization of the residual bran - Beer production. Residual streams: Characterization and valorization - Production of oligomers from residual lignocellulosic materials - Production of juices. Valorization of the residual solid residue

Planning

	Class hours	Hours outside the classroom	Total hours
Lecturing	13	31.2	44.2
Seminars	12	40.8	52.8
Mentored work	1	20	21
Presentation	2	30	32

*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

Methodologies

	Description
Lecturing	Exposition in classroom of the principles of the subject
Seminars	Resolving problems and/or exercises. Resolution in clasroom of case studies, and additional exercises will be proposed for out-of-class resolution, with subsequent delivery and evaluation
Mentored work	Elaboration by the student of a document dealing with some of the contents of the matter. This document will be delivered and evaluated, taking into account the wording, and the ability to synthesize and organize bibliographic information.
Presentation	The tutored work will be presented in classroom to the teacher and other students. Content organization, subject domain and expoistion will be considered in evaluation. The answers to the questions made by the teacher and colleagues will be taken into account. Participation of classmates will also be considered according to their comments and questions.

Personalized assistance

Methodologies	Description
Lecturing	Any doubt/clarification asked by students will be answered
Presentation	The doubts and queries made by the students during the exhibition will be answered
Mentored work	Direction of works, resolving doubts, suggesting sources of information, orienting in the realization of subjects, etc. The students will be attended both in person at tutorials, by the e-learning platform and by e-mail
Seminars	Personalized follow-up in the resolution and/or analysis of practical cases exposed in the classroom for joint discussion/resolution with students. Personalized attention in the works planned to be made out of classroom, with feedback once corrected. The communication in these cases will be done preferably through the e-learning platform of the University of Vigo or e-mail, together with the in person tutorials.

Assessment

	Description	Qualification	Training and Learning Results			
Lecturing	Exam including both theoretical and practical aspects of the whole matter. This methodology evaluates all the learning outcomes.	40		B3	C38 C40 C41 C42	D2 D5
Seminars	Autonomous resolution, both in the classroom and out of classroom, of exercises and case studies. The student can have support / orientation during the tutorial hours or through the e-learning platform of the University of Vigo. This methodology evaluates all the learning outcomes.	30	A4	B3	C38 C40	D5
Mentored work	Evaluation of the elaborated document, taking into account the used sources of information, the presented information, its organization and correct writing. This methodology evaluates all the learning outcomes.	15	A4	B3		D2

Presentation	As "trasmitter": Organization and synthesis of the presented material will be evaluated, presentation clarity and the answers to the questions. As "receptor": Participation in the turn of questions after the presentation of classmates will be evaluated, considering the comments/questions that have been made. This methodology evaluates all the learning outcomes.	15	A4	B2 B3	D2 D3

Other comments on the Evaluation

1. **Students with work responsabilities**: students will follow the subject as normal when they are available to attend the teaching activities. Otherwise, students must indicate their situation within the first 2 weeks of class to the responsible of the course. In this case, students must provide proven reasons for this choice (usually work-related), which will be considered individually by the person in charge of the course.
2. It is necessary to **pass the subject exam** (with at least 5 points out of 10). In other case, the final qualification will be the one corresponding to the exam, after applying the corresponding ponderation.
3. In the case of students who do not attend the "**Seminars**" methodologies (delivery of the proposed exercises for resolution), they will have the alternative of taking an additional exam in the same date as the general one, which will include questions/problems dealt in the abovementioned seminars.
4. In the case of students not attending the "**Presentations / exhibition**s" methodologies, they can upload a video recording their presentation to the e-learning platform (Moovi), and answer the questions posed by the teacher and the students in the chat. Alternatively, they will be able to complement such assistance by intensifying the participation with "**Mentored work**", being the methodology qualification of 30% in this case.
5. In the **July exam**, students can choose to take the parts of the exam or the methodologies that they have not passed in the June exam or those that they wish to surpass their previous grade obtained in June. The grade assigned will be the best one obtained in June or July for each part of the exam or methodology.
6. Those students who have completed **less than 30%** of the methodologies "Seminars" (Delivery of the proposed exercises for resolution), "Mentored work", and/or "Presentations / exhibitions", and do not take the exam, will obtain the qualification "not presented". Otherwise, the qualification will be the one calculated following the procedure exposed above.
7. Communication with students will be done through the e-learning platform of the University of Vigo (**Moovi**).
8. Students may choose to take the exam in the "**End of Career**" call. In this case the qualification will correspond to that obtained in the exam, that will include questions/problems posed in lecture sessions, problems / exercises solved in classroom, or proposed exercises.
9. **Official dates of exams**: January 24, 2023 at 10:00 a.m. and July 4, 2023 at 10:00 a.m. The date for the realization of the "End of Career" examination is September 20, 2022 at 10:00 a.m. In case of possible date changes, consult the Center`s website.

Sources of information

Basic Bibliography

Complementary Bibliography

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Ibarz, A. e Barbosa Cánovas, G. V., **Operaciones Unitarias en la Ingeniería de Alimentos**, Ed Technomic Publishing Co., 1999

Fryer, P. J., Pyle D. L., Rielly, C. D., **Chemical Engineering for the Food Industry**, Ed. Blackie Academic and Profesional, 1997

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Bylund G., **Dairy processing handbook**, Tetra Pak Processing Systems AB, 1995

Recommendations