



IDENTIFYING DATA

Industrial installations

Subject	Industrial installations			
Code	001G281V01914			
Study programme	(*)Grao en Enxeñaría Agraria			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Optional	4th	1st
Teaching language	Galician			
Department				
Coordinator	Santos Reyes, Valentín			
Lecturers	Santos Reyes, Valentín			
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Web				
General description	(*)Nesta materia analízanse a estrutura dos procesos industriais, as etapas e aspectos considerados no seu deseño, e aspectos relacionados cas operacións básicas involucradas			

Competencies

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.
D1	Analysis, organization and planning skills.
D3	Oral and written communication skills in local and foreign languages.
D5	Problem-solving and decision-making skills.

Learning outcomes

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
RA3: To know the main processes for production of food products. To know generated wastes and possibilities for their exploitation and/or management				
RA3: To know the main processes for production of food products. To know generated wastes and possibilities for their exploitation and/or management	A4	B3	C38 C41 C42	D1 D3 D5
RA4: To know the main auxiliary equipment involved 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	D1 D3 D5

Contents

Topic

Introduction	<ul style="list-style-type: none"> - Chemical/Food processes - Stages for process design - Process simulators - Economics. Process feasibility
Fundamentals of process engineering	<ul style="list-style-type: none"> - Unit operations - Energy integration
Equipment design and sizing	<ul style="list-style-type: none"> - Liquid pumping. NPSH - Movement of solids - Agitation and mixture
Auxiliary equipment used in the food industry	<ul style="list-style-type: none"> - "in situ" cleaning systems. Hygienic design - Steam production - Refrigeration
Study of representative processes employing agro-food based raw materials or related residual streams	<ul style="list-style-type: none"> - 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 classroom 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 exposition 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 D1 C40 D5 C41 C42
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 D5 C40

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	D1
Presentation	As "transmitter": 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	D1 D3

Other comments on the Evaluation

1. It is necessary to pass the exam of all the subject (obtaining a minimum of 5 points on a 10 base). In other case the global qualification will be the one corresponding to the exam, after applying the corresponding ponderation..
2. In the case of students not assisting to the methodologies of "Seminars" (Delivery of the exercises proposed for resolution) they will have the alternative possibility to realize an additional exam, in the same date that the general exam, that will include questions/problems treated in the abovementioned seminars.
3. In the case of students not attending the "Presentations / exhibitions" methodologies, they can upload a video recording their exposure to the e-learning platform, and subsequent answer via chat or message to the questions proposed by classmates and by the teacher. Alternatively, they will be able to supplement the aforementioned assistance by intensifying the participation in "Tutored works", having this methodology a qualification of 30% in this case.
4. In July the student can opt for examining of the exam parts or of the methodologies not surpassed in June, or of those that wish to improve his previous June qualification. The assigned qualification will be the best of that obtained in June or July for every exam part or methodology.
5. Those students having done less than 30% of the methodologies "Seminars" (Delivery of the exercises proposed for resolution), "Tutored works", and/or "Presentations / exhibitions", and not making the exam, the obtained qualification will be "not presented". In other case the qualification will be that calculated following the above exposed procedure.
6. The communication with the students will be made through the e-learning platform of the University of Vigo.
7. Students can opt to be examined in the "End of Career" call. In this case the qualification will correspond to that obtained in an exam, that will include questions/problems considered in master sessions, problems / exercises solved in classroom, or problems and/or exercises proposed for realization outside the classroom and further delivery.
8. Official dates for the realization of the examinations: 27 January of 2021 at 10.00 and 2 July of 2021 at 10.00. The date for the realization of the "End of Career" examination is 09 September of 2020 at 10.00. Considering possible mistakes and/or modifications, please check it at the Faculty board and/or Faculty website.

Sources of information

Basic Bibliography

Complementary Bibliography

- A. Madrid, **Manual de Industrias Alimentarias**, Cuarta, AMV Ediciones, 2010
- Stanley M. Walas, **Chemical Process Equipment**, Butterworth Heinemann, 1990
- Arturo Giménez Gutiérrez, **Diseño de procesos en ingeniería química**, Reverté, 2003
- Perry, R. e Green, D. W., **Manual del Ingeniero Químico**, McGraw Hill, 2001
- 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
- Geankoplis, C. J., **Transport unit operations**, Ed. Prentice Hall International, Inc., 1993
- López, A., **Diseño de Industrias Agroalimentarias**, Ed. A. Madrid Vicente, 1990
- Heldman, D.R. e Lund, D.B., **Handbook of food engineering**, CRC Press, 2007
- Toledo, R.T., **Fundamentals of food process engineering**, Springer, 2007
- Bylund G., **Dairy processing handbook**, Tetra Pak Processing Systems AB, 1995

Recommendations

Contingency plan

Description

=== EXCEPTIONAL PLANNING ===

Given the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University of Vigo establishes an extraordinary planning that will be activated when the administrations and the institution itself determine it, considering safety, health and responsibility criteria both in distance and blended learning. These already planned measures guarantee, at the required time, the development of teaching in a more agile and effective way, as it is known in advance (or well in advance) by the students and teachers through the standardized tool.

=== ADAPTATION OF THE METHODOLOGIES ===

* Teaching methodologies maintained

Methodologies involving the resolution of exercises outside the classroom, further uploading to the e-learning platform and evaluation suffers no modification. More specifically the "Supervised work" and exercises proposed for autonomous out-of-class resolution in "Seminars" evaluation is maintained.

* Teaching methodologies modified

"Lecturing" will be taught virtually, preferably by using the "Virtual Classroom" within the "Virtual Campus" of the University of Vigo.

"Presentation" of the supervised work will be presented also by using the Virtual Classroom.

* Non-attendance mechanisms for student attention (tutoring)

Tutoring will be attended by email or through the Virtual Office, by appointment

* Modifications (if applicable) of the contents

No modifications

=== ADAPTATION OF THE TESTS ===

Modification affects basically the way how to carry out the different exams, being realized by virtual tests. The weighting of each part will not be affected.
