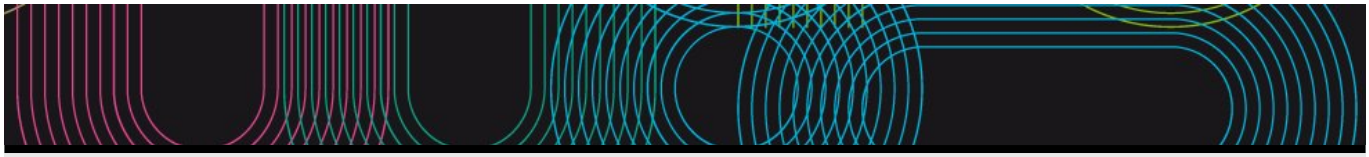
Universidade Vigo

Subject Guide 2026 / 2027



IDENTIFYING DATA				
Food Chemistry and Biochemistry				
Subject	Food Chemistry and Biochemistry			
Code	O01M139V01110			
Study programme	Máster Universitario en Nutrición			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	3	Optional	1st	1st
Teaching language	#EnglishFriendly Spanish Galician English			
Department				
Coordinator	González Matías, Lucas Carmelo Rúa Rodríguez, María Luísa			
Lecturers	Fuciños González, Clara González Matías, Lucas Carmelo Rúa Rodríguez, María Luísa			
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Web				
General description	The objective of this subject is to identify and analyze through which mechanisms food molecules determine their properties and chemical reactivity, as well as to apply this knowledge to improve the formulation, processing and stability of food. Bibliographic resources and specific databases will be used to deepen into the latest scientific advances in food formulation and their preservation. English Friendly subject: International students may request from the teachers: a) resources and bibliographic references in English, b) tutoring sessions in English, c) exams and assessments in English.			

Training and Learning Results	
Code	
A1	
A5	
B1	(*)Adquirir coñecementos avanzados e demostrar, nun contexto de investigación científica e tecnolóxica ou altamente especializado, unha comprensión detallada e fundamentada dos aspectos teóricos e prácticos e da metodoloxía de traballo nun ou en mais campos de estudo
B4	(*)Ser capaz de predicir e controlar a evolución de situacións complexas mediante o desenrolo de novas e innovadoras metodoloxías de traballo adaptadas ao ámbito científico/investigador, tecnolóxico ou profesional concreto, en xeral multidisciplinar, no que se desenvolva a súa actividade
C2	(*)Ter adquirido coñecementos do destino e da función das principais moléculas combustíbeis: glícidos, lípidos e proteínas.
D1	
D3	

Expected results from this subject	Training and Learning Results			
At the end of the course, students are expected to proficiently distinguish the biochemical properties of various food components.	A1 A5	B1 B4	C2	D1 D3

Contents	
Topic	
TOPIC 1	WATER: Concept of water activity. Sorption isotherms.

TOPIC 2	CARBOHYDRATES: Monosaccharides and polysaccharides. Techno-functional properties.
TOPIC 3	LIPIDS: fatty acids and triglycerides. Lipid oxidation. Crystallisation of fats.
TOPIC 4	PROTEINS and ENZYMES: Protein structure. Techno-functional properties of proteins. Enzyme kinetics. Enzymes in food.
TOPIC 5	BROWNING REACTIONS: enzymatic and non-enzymatic browning.
TOPIC 6	VITAMINS, MINERALS and ADDITIVES
TOPIC 7	MILK: Introduction. Biochemical processes during technological treatments.
TOPIC 8	MEAT: Introduction. Biochemical processes during technological treatments.
TOPIC 9	FISH: Introduction. Biochemical processes during technological treatments.
TOPIC 10	CEREALS, FRUITS, VEGETABLES AND PULSES

Planning

	Class hours	Hours outside the classroom	Total hours
Mentored work	5	50	55
Practices through ICT	3	0	3
Case studies	3	8	11
Oral exam	2	4	6

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

Methodologies

	Description
Mentored work	Students, in groups of 1-2 people, will choose a project to improve or solve problems in food products due to processing conditions, problems with ingredients, storage abuse, improvement of nutritional quality, etc., with the aim of placing them in the context of industrial reality in the food field. The work may require literature research, hypothesis generation, research project design, data analysis, etc. Throughout the teaching period of the subject, students will carry out the work autonomously and with the support of tutorials. The aim of this activity is to develop the specific competences of the subject and to promote in particular the capacity for critical analysis to identify needs or opportunities to improve the nutritional and functional quality of foods, as well as the capacity to propose new processes based on the application or development of scientific-technological knowledge.
Practices through ICT	(*)consistirán na participación activa durante as leccións maxistráis mediante a realización de cálculos, manexo de bases de datos e ferramentas on-line.
Case studies	(*)Actividades nas que se avalían publicacións científicas, formúlanse problemas e/ou exercicios relacionados coa materia.

Personalized assistance

Methodologies	**Description**
Mentored work	As with the resolution of problems and/or exercises, each student will be guided in the choice of the topic to be developed in the tutored work and will be guided throughout the elaboration of the same.
Practices through ICT	
Case studies	
Tests	**Description**
Oral exam	

Assessment

	Description	Qualification	Training and Learning Results
Mentored work	The justification of the work proposed and carried out by the students will be evaluated based on its applied interest, scientific-technological value, and novelty. The quality of the work will be assessed in terms of scientific rigor and formal structure. Creativity and innovation will also be evaluated. Additionally, the students' ability to identify critical points in their proposal and consider possible alternatives will be taken into account.	40	A1 B1 C2 D3 A5 B4

Practices through ICT	Active participation and the ability to resolve the issues raised will be evaluated.	5	A1 B1 C2 D1 A5 B4 D3
Case studies	The quality of the analysis of articles and/or the resolution of the proposed problems and cases will be evaluated based on their scientific rigor and the organization in the presentation of the results.	40	A1 B1 C2 D1 A5 B4
Oral exam	The students' ability to present the objective and justification of their supervised work proposal in an orderly, clear, and concise manner, as well as the rationale and development of the proposed process, and the difficulties and solutions posed, will be evaluated. Additionally, the ability to defend their proposal and constructively accept criticism during the debate following the presentation will be assessed.	15	A1 B1 C2 D1 A5 B4

Other comments on the Evaluation

Those students who, for a justified and duly documented cause, could not attend the planned in-person activities will proceed as follows:

They will have to carry out individually all the activities planned in the "case study" activities

They will have to present a report on a specific subject followed by a question time with the teacher that will be evaluated

In the event of not being able to attend either the presentation session of the supervised works, this will be done on-line

Face-to-face tutorial will change to remote mode with these students through email, Moovi platform, etc.

Students who do not pass the subject in the corresponding quarter, will be able to opt for a second opportunity in the July call, fulfilling the same requirements as in the quarter evaluation.

Any use of **artificial intelligence (AI)** in academic work must be disclosed, specifying the tool used, the purpose for which it was used, the extent of its contribution, and which parts of the work are the result of human authorship.

Where there are reasonable grounds to suspect the improper use of AI, the teaching staff may reject the submission, request additional evidence, or refer the matter to the appropriate disciplinary administrative procedure.

Sources of information

Basic Bibliography

Damodaran, S.; Parkin, K.L., **Fennema química de los alimentos**, 4ª, Acribia, 2019

Complementary Bibliography

Damodaran, S.; Parkin, K.L., **Fennema's food chemistry. Español**, 4ª, Acribia, 2019

Salvador Badui Dergal, **Química de los alimentos**, 5ª ed., Pearson Educación, 2013

Wong, D.W.S., **Mechanisms and theory in Food Chemistry**, Springer International Publishing, 2017

Yufera, E.P., **Química de los alimentos**, Síntesis, D.L., 1999

Naz, S., **Enzymes and food**, Oxford Univerity Press,, 2002

Belitz, H.D.; Grosch, W, **Química de los alimentos**, 3ª ed, Acribia, 2011

Weaver, James Daniel, **The food chemistry laboratory : a manual for experimental foods, dietetics, and food scientists / Connie Weaver, James Daniel**, 2nd ed., Boca Raton : CRC Press, 2003

Recommendations

Subjects that it is recommended to have taken before

Biochemistry and Molecular Biology/O01M139V01101