# Universida<sub>de</sub>Vigo

#### Educational guide 2023 / 2024



#### Presentation

The studies of Chemistry have a large tradition at the University of Vigo, where it has been taught during more than 30 years. The stablisment of the Universitary System of Galicia in the 90s and the current process of implantation of the European Space of Higher Education (EEES) modified the offer of degrees, but no the pioneering spirit of the chemists in research of in the quest for a better service to the society.

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#### Degrees given in the Faculty

Degree in Chemistry

- Masters And Doctorates:
  - Industry and Chemical Research and Industrial Chemistry
  - $\circ~$  Theoretical chemistry and Computational Modelling
- Master:
  - Science and Technology of Conservation of Fishing Products

#### Web page

Information about the Faculty of Chemistry:

http://quimica.uvigo.es

## Máster Universitario en Ciencia y Tecnología de Conservación de Productos de la Pesca

Subjects			
Year 2nd			
Code	Name	Quadmester	Total Cr.
V11M085V02303	Quality of fishery and aquaculture products	1st	5
V11M085V02304	Food security of fishery and aquaculture products	lst	5
V11M085V02405	Internships	2nd	9
V11M085V02406	Final Dissertation	2nd	10

IDENTIFYIN	G DATA			
Quality of f	ishery and aquaculture products			
Subject	Quality of fishery			
	and aquaculture			
	products			
Code	V11M085V02303			
Study	Máster			
programme	Universitario en			
	Ciencia y			
	Tecnología de			
	Conservación de			
	Productos de la			
	Pesca			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	5	Mandatory	2nd	1st
Teaching	Spanish			
language	Galician			
Department				
Coordinator	Longo González, María Asunción			
Lecturers	Barros Velázquez, Jorge			
	García Cabado, Ana			
	Goicoechea Lamas, Irene			
	Longo González, María Asunción			
	Losada Iglesias, Vanesa			
	Quintela Porro, María Corina			
E-mail	mlongo@uvigo.es			
Web	http://pesca_master.webs.uvigo.es			
General	In this subject the modifications of the organolepti	c characteristics that	t occur after the	2
description	capture of the fish and the effects of refrixeration a	and confection on th	e loss of freshn	ess of the
	fishing products, as well as the freshness determin	nation methods that	exist. Students	will be studied
	Methods of recognizing food alterations during sto	rage and how to dete	ect	
	the biochemical changes subsequent to the captur	e and during conser	vation. The	
	microbiological criteria and procedures to analyze	fish quality and relat	ed legislation.	
	Even the quick recognition tests will be studied			
	and specific techniques of the alterations of frozen	toods and preserve	d in state	
	trozen.			

Training	and	Learning	Results
Carla			

Code	
A2	That students know how to apply the knowledge acquired and their ability to solve problems in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their area of study.
A3	That students are able to integrate knowledge and face the complexity of making judgments based on information that, being incomplete or limited, includes reflections on social and ethical responsibilities linked to the application of their knowledge and judgments.
A4	That students know how to communicate their conclusions, and the knowledge and ultimate reasons that sustain them, to specialized and non-specialized audiences in a clear and unambiguous way.
B1	That the students acquire the comprehension, analysis and synthesis capacities.
B2	That students develop oral and written communication skills in the two co-official languages of autonomy (Spanish and Galician).
B3	That the students develop the skills to perform experimental work, handling of material and biological elements and related programs.
C11	Approach to quality control of each of the production lines of fishery products. Basic knowledge of product quality management.
C12	Acquire basic knowledge and interpret the legislation applicable to the facilities where the handling and treatment of fishery products is carried out along the commercial chain: hygiene, labeling, food safety, plant self-control (APPCC), etc.
D1	Ability to understand the meaning and application of the gender perspective in the different fields of knowledge and professional practice with the aim of achieving a more just and egalitarian society.
D2	Sustainability and environmental commitment. Equitable, responsible and efficient use of resources.
D3	Autonomous work capacity and decision making.
D5	Commitment to ethics in the profession and in society.
Evn	acted results from this subject

**Expected results from this subject** Expected results from this subject

Training and Learning Results

Understand the modification of organoleptic characteristics after capture.          Appreciate the effects of refrigeration and freezing on the loss of freshness of the products of fishing.       A         Appreciate the effects of refrigeration and freezing on the loss of freshness of the products of fishing.       A         Appreciate the effects of refrigeration and freezing on the loss of freshness of the products of fishing.       A         Know and interpret the methods of determination of freshness.       A         Know the methods of recognition of food alterations during storage.       A2         Know the methods of recognition of food alterations during storage.       A2         Detect biochemical changes subsequent to capture and during conservation.       A3         B2       C11         C12       D2         Detect biochemical changes subsequent to capture and during conservation.       A2         A3       B2         C11       C12         D2       D3         Detect biochemical changes subsequent to capture and during conservation.       A2         A3       B2         C11       C12         D2       D3         Detect biochemical changes subsequent to capture and during conservation.       A2         A3       B2         C11       C12         D3       D3 <td< th=""><th></th><th></th></td<>		
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Detect biochemical changes subsequent to capture and during conservation.       A2         A3       A4         B2       B3         C11       C12         D2       D3         B3       C11         C12       D2         D3       D5         Know the microbiological criteria and procedures to analyze fish quality and related legislation.       A2         A3       A3         B1       B2         B2       D5         Know the microbiological criteria and procedures to analyze fish quality and related legislation.       A2         A3       B1         B2       D5         Know the rapid recognition tests and specific techniques of the alterations of frozen foods and preserved       A2         D3       D5         Know the rapid recognition tests and specific techniques of the alterations of frozen foods and preserved       A2         D3       D5         Understand the criteria and procedures for quality control of packaging and for the detection of defects.       A2         B1       B2         C11       C12         D3       D5         Understand the criteria and procedures for quality control of packaging and for the detection of defects.       A2         B1 <t< td=""><td></td><td>C12</td></t<>		C12
Date of the process of the alterations of frozen foods and preserved A2         Know the rapid recognition tests and specific techniques of the alterations of frozen foods and preserved A2         Know the rapid recognition tests and specific techniques of the alterations of frozen foods and preserved A2         In frozen state.         Date of the criteria and procedures for quality control of packaging and for the detection of defects.         A2         A3         A4         B3         C11         C12         D3         D5         Know the microbiological criteria and procedures to analyze fish quality and related legislation.         A3         B1         B2         C11         C12         D3         D5         Know the rapid recognition tests and specific techniques of the alterations of frozen foods and preserved A2         D1         D3         D5         Understand the criteria and procedures for quality control of packaging and for the detection of defects.         A2         D1         D2         D1         D2		C12 D2
Detect biochemical changes subsequent to capture and during conservation.       A2         A3       A4         B2       B3         C11       C12         D2       D3         D5       D5         Know the microbiological criteria and procedures to analyze fish quality and related legislation.       A2         A3       A3         B1       B2         C11       C12         D5       C11         Know the microbiological criteria and procedures to analyze fish quality and related legislation.       A2         A3       B1         B2       C11         C12       D2         D3       D5         Know the rapid recognition tests and specific techniques of the alterations of frozen foods and preserved       A2         D5       D5         Understand the criteria and procedures for quality control of packaging and for the detection of defects.       A2         B1       B2         C11       C12         D5       D5         Understand the criteria and procedures for quality control of packaging and for the detection of defects.       A2         B2       C11       C12         D5       D1       D1         D1       D2 <td></td> <td>50</td>		50
A3 A4 B2 B3 C11 C12 D2 D3 D5 Know the microbiological criteria and procedures to analyze fish quality and related legislation. A3 B1 B2 C11 C12 D2 D3 D5 Know the microbiological criteria and procedures to analyze fish quality and related legislation. A3 B1 B2 C11 C12 D2 D3 D5 Know the rapid recognition tests and specific techniques of the alterations of frozen foods and preserved C11 C12 D3 D5 Know the rapid recognition tests and specific techniques of the alterations of frozen foods and preserved C11 C12 D3 D5 VInderstand the criteria and procedures for quality control of packaging and for the detection of defects. C11 C12 D3 D5 VInderstand the criteria and procedures for quality control of packaging and for the detection of defects. C11 C12 D1 D2	Detect biochemical changes subsequent to capture and during conservation	Δ2
A4         B2         B3         C11         C12         D2         D3         D5         Know the microbiological criteria and procedures to analyze fish quality and related legislation.       A2         A3         B1         B2         C11         C12         D3         D5	better biochemical changes subsequent to captare and during conservation.	Δ3
B2       B3         C11       C12         D2       D3         D5       D5         Know the microbiological criteria and procedures to analyze fish quality and related legislation.       A2         A3       B1         B2       D3         D5       D5         Know the microbiological criteria and procedures to analyze fish quality and related legislation.       A2         A3       B1         B2       C11         C12       D2         D3       D5         Know the rapid recognition tests and specific techniques of the alterations of frozen foods and preserved       A2         in frozen state.       B1         D3       D5         Understand the criteria and procedures for quality control of packaging and for the detection of defects.       A2         B1       B2         C11       C12         D3       D5         Understand the criteria and procedures for quality control of packaging and for the detection of defects.       A2         B1       B2         C11       C12         D1       D2		Δ4
B3       C11         C12       D2         D3       D5         Know the microbiological criteria and procedures to analyze fish quality and related legislation.       A2         A3       B1         B2       C11         C12       D2         D3       D5         Know the microbiological criteria and procedures to analyze fish quality and related legislation.       A2         A3       B1         B2       C11         C12       D2         D3       D5         Know the rapid recognition tests and specific techniques of the alterations of frozen foods and preserved A2         in frozen state.       B2         C11       C12         D3       D5         Understand the criteria and procedures for quality control of packaging and for the detection of defects.       A2         B1       B2         C11       C12         D3       D5         Understand the criteria and procedures for quality control of packaging and for the detection of defects.       A2         B1       B2         C11       C12         D1       D2		B2
C11       C12         D3       D5         Know the microbiological criteria and procedures to analyze fish quality and related legislation.       A2         A3       B1         B2       C11         C12       D2         D3       D5         Know the microbiological criteria and procedures to analyze fish quality and related legislation.       A2         A3       B1         B2       C11         C12       D2         D3       D5         Know the rapid recognition tests and specific techniques of the alterations of frozen foods and preserved       A2         in frozen state.       B2         C11       C12         D3       D5         Understand the criteria and procedures for quality control of packaging and for the detection of defects.       A2         B1       B2         C11       C12         D3       D5         Understand the criteria and procedures for quality control of packaging and for the detection of defects.       A2         B1       B2         C11       C12         D1       D2		B3
C12       D2         D3       D5         Know the microbiological criteria and procedures to analyze fish quality and related legislation.       A2         A3       B1         B2       C11         C12       D2         D3       D5         Know the microbiological criteria and procedures to analyze fish quality and related legislation.       A2         A3       B1         B2       C11         C12       D2         D3       D5         Know the rapid recognition tests and specific techniques of the alterations of frozen foods and preserved an frozen state.       A2         In frozen state.       B2         Understand the criteria and procedures for quality control of packaging and for the detection of defects.       A2         B1       B2         C11       C12         D3       D5         Understand the criteria and procedures for quality control of packaging and for the detection of defects.       A2         B1       B2         C11       C12         D3       D5         Understand the criteria and procedures for quality control of packaging and for the detection of defects.       A2         D1       D2		C11
D2       D3         Know the microbiological criteria and procedures to analyze fish quality and related legislation.       A2         A3       B1         B2       C11         C12       D2         D3       D5         Know the rapid recognition tests and specific techniques of the alterations of frozen foods and preserved and posterial for quality control of packaging and for the detection of defects.       A2         Understand the criteria and procedures for quality control of packaging and for the detection of defects.       A2         B1       B2         C11       C12         D3       D5         Understand the criteria and procedures for quality control of packaging and for the detection of defects.       A2         B1       B2         C11       C12         D3       D5         Understand the criteria and procedures for quality control of packaging and for the detection of defects.       A2         B1       B2         C11       C12         D3       D5		C12
D3       D5         Know the microbiological criteria and procedures to analyze fish quality and related legislation.       A2         A3       B1         B2       C11         C12       D2         D3       D5         Know the rapid recognition tests and specific techniques of the alterations of frozen foods and preserved in frozen state.       A2         In frozen state.       B2         C11       C12         D3       D5         Understand the criteria and procedures for quality control of packaging and for the detection of defects.       A2         B1       B2         C11       C12         D3       D5         Understand the criteria and procedures for quality control of packaging and for the detection of defects.       A2         B1       B2         C11       C12         D3       D5         Understand the criteria and procedures for quality control of packaging and for the detection of defects.       A2         B1       B2         C11       C12         D3       D5         D4       D1         D2       D2		D2
D5         Know the microbiological criteria and procedures to analyze fish quality and related legislation.       A2         A3       B1         B2       C11         C12       D2         D3       D5         Know the rapid recognition tests and specific techniques of the alterations of frozen foods and preserved in frozen state.       A2         C11       C12         D3       D5         Understand the criteria and procedures for quality control of packaging and for the detection of defects.       A2         B1       B2         C11       C12         D3       D5         Understand the criteria and procedures for quality control of packaging and for the detection of defects.       A2         B1       B2         C11       C12         D3       D5		D3
Know the microbiological criteria and procedures to analyze fish quality and related legislation.       A2         A3       B1         B2       C11         C12       D2         D3       D5         Know the rapid recognition tests and specific techniques of the alterations of frozen foods and preserved       A2         in frozen state.       B2         Understand the criteria and procedures for quality control of packaging and for the detection of defects.       A2         B1       B2         C11       C12         D3       D5         Understand the criteria and procedures for quality control of packaging and for the detection of defects.       A2         B1       B2         C11       C12         D3       D5         Understand the criteria and procedures for quality control of packaging and for the detection of defects.       A2         B1       B2         C11       C12         D1       D2		D5
A3 B1 B2 C11 C12 D2 D3 D5 Know the rapid recognition tests and specific techniques of the alterations of frozen foods and preserved in frozen state. Understand the criteria and procedures for quality control of packaging and for the detection of defects. Understand the criteria and procedures for quality control of packaging and for the detection of defects. B1 B2 C11 C12 D3 D5 Understand the criteria and procedures for quality control of packaging and for the detection of defects. B1 B2 C11 C12 D3 D5 Understand the criteria and procedures for quality control of packaging and for the detection of defects. B1 B2 C11 C12 D3 D5 Understand the criteria and procedures for quality control of packaging and for the detection of defects. B1 B2 C11 C12 D3 D5 Understand the criteria and procedures for quality control of packaging and for the detection of defects. B1 B2 C11 C12 D1 D2	Know the microbiological criteria and procedures to analyze fish guality and related legislation.	A2
B1       B2         C11       C12         D2       D3         D3       D5         Know the rapid recognition tests and specific techniques of the alterations of frozen foods and preserved       A2         in frozen state.       B2         C11       C12         D3       D5         Understand the criteria and procedures for quality control of packaging and for the detection of defects.       A2         B1       B2         C11       C12         D3       D5         Understand the criteria and procedures for quality control of packaging and for the detection of defects.       A2         B1       B2         C11       C12         D3       D5         D1       D2		A3
B2       C11         C12       D2         D3       D5         Know the rapid recognition tests and specific techniques of the alterations of frozen foods and preserved in frozen state.       A2         In frozen state.       B2         C11       C12         D3       D5         Understand the criteria and procedures for quality control of packaging and for the detection of defects.       A2         B1       B2         C11       C12         D3       D5         Understand the criteria and procedures for quality control of packaging and for the detection of defects.       A2         B1       B2         C11       C12         D3       D5		B1
C11       C12         D2       D3         D5       D5         Know the rapid recognition tests and specific techniques of the alterations of frozen foods and preserved in frozen state.       A2         D2       D3         D5       D1         D5       D1         D2       D2         D3       D5		B2
C12       D2         D3       D5         Know the rapid recognition tests and specific techniques of the alterations of frozen foods and preserved       A2         in frozen state.       B2         C11       C12         D3       D5         Understand the criteria and procedures for quality control of packaging and for the detection of defects.       A2         B1       B2         C11       C12         D3       D5         Understand the criteria and procedures for quality control of packaging and for the detection of defects.       A2         B1       B2         C11       C12         D1       D2		C11
D2       D3         D5       D5         Know the rapid recognition tests and specific techniques of the alterations of frozen foods and preserved in frozen state.       A2         B2       C11         C12       D3         D5       D5         Understand the criteria and procedures for quality control of packaging and for the detection of defects.       A2         B1       B2         C11       C12         D3       D5         Understand the criteria and procedures for quality control of packaging and for the detection of defects.       A2         B1       B2         C11       C12         D1       D2		C12
D3       D5         Know the rapid recognition tests and specific techniques of the alterations of frozen foods and preserved       A2         in frozen state.       B2         C11       C12         D3       D5         Understand the criteria and procedures for quality control of packaging and for the detection of defects.       A2         B1       B2         C11       C12         D3       D5         Understand the criteria and procedures for quality control of packaging and for the detection of defects.       A2         B1       B2         C11       C12         D1       D2		D2
Sector       D5         Know the rapid recognition tests and specific techniques of the alterations of frozen foods and preserved in frozen state.       A2         B2       C11         C12       D3         D3       D5         Understand the criteria and procedures for quality control of packaging and for the detection of defects.       A2         B1       B2         C11       C12         D3       D5         Understand the criteria and procedures for quality control of packaging and for the detection of defects.       A2         B1       B2         C11       C12         D1       D1         D2       D1		D3
Know the rapid recognition tests and specific techniques of the alterations of frozen foods and preserved A2 in frozen state. B2 C11 C12 D3 D5 Understand the criteria and procedures for quality control of packaging and for the detection of defects. A2 B1 B2 C11 C12 D1 D2 D1 D2		D5
in frozen state. B2 C11 C12 D3 D5 Understand the criteria and procedures for quality control of packaging and for the detection of defects. B1 B2 C11 C12 D3 D5 Understand the criteria and procedures for quality control of packaging and for the detection of defects. D1 D2	Know the rapid recognition tests and specific techniques of the alterations of frozen foods and preserved	A2
C11 C12 D3 D5 Understand the criteria and procedures for quality control of packaging and for the detection of defects. A2 B1 B2 C11 C12 D1 D2	in frozen state.	B2
C12 D3 D5 Understand the criteria and procedures for quality control of packaging and for the detection of defects. A2 B1 B2 C11 C12 D1 D2		C11
D3 D5 Understand the criteria and procedures for quality control of packaging and for the detection of defects. A2 B1 B2 C11 C12 D1 D2		C12
D5 Understand the criteria and procedures for quality control of packaging and for the detection of defects. A2 B1 B2 C11 C12 D1 D2		D3
Understand the criteria and procedures for quality control of packaging and for the detection of defects. A2 B1 B2 C11 C12 D1 D2		D5
B1 B2 C11 C12 D1 D2	Understand the criteria and procedures for quality control of packaging and for the detection of defects.	A2
B2 C11 C12 D1 D2		B1
C11 C12 D1 D2		B2
C12 D1 D2		C11
D1 D2		C12
D2		D1
		D2

Know the quality control of each of the lines of preparation of PPAs.	A3
	B2
	B3
	C11
	C12
	D1
	D3
	D5
Manage the regulations related to the technical-legal criteria applicable to the different PPAs.	A3
	A4
	B3
	C11
	C12
	D1
	D2
Acquire the basic knowledge of product quality management.	A2
	A3
	B1
	B2
	C11
	C12
	D2
	D3
NewAcquire basic knowledge about inspection of frozen fish. Intrinsic procedures and characteristics	5. A2
	A4
	B2
	B3
	C11
	C12
	D3
	D5
Know the means, materials and machines necessary for the inspection and distinguish the phases a	nd the A2
main aspects of this process.	A4
	DI D2
	BZ
	D2
	D3 D5
Know and interpret the methods of product sampling and evaluation	<u>A3</u>
and and methods of produce outpilling and evaluation.	A4
	B2
	B3
	C11
	C12
	D1
	D2
Contonts	
Tonic	
ITEM 1 Basic aspects of quality control	es canture it
of fishery and aquaculture products - Effects of refrigeration on loss of freshness	

of fishery and aquaculture products (PPAs).	<ul> <li>Effects of refrigeration on loss of freshness.</li> <li>Modifications of fish constituents during the processing and storage.</li> <li>Abiotic contaminants.</li> </ul>
ITEM 2. Related Microbiological Aspects	-Biotoxins marine.
with the conservation of fish.	<ul> <li>Legislative advances and alternative methods.</li> </ul>
ITEM 3. Physical methods of quality control of fishery products	<ul> <li>Rheology of gels for the determination of physical properties:</li> <li>1) Oscillatory methods (test in tension sweeps and sweep of frequency;</li> <li>2) Static methods (load-recovery test temperature constant: determination of gel strength, exponent of relaxation and relax time</li> </ul>
ITEM 4. Quality control in containers. Defects most common in packaged products.	<ul> <li>Know the methods of recognition of defects.</li> <li>Know the guidelines for action in the daily practice of the industry.</li> </ul>

- Determination of sensory, chemical and microbiological parameters of quality,

- Nutritional composition, presence of additives and contaminants.

Planning			
	Class hours	Hours outside the	Total hours
		classroom	
Lecturing	26	56	82
Laboratory practical	10	25	35
Seminars	2	2	4
Objective questions exam	1	1	2
Self-assessment	1	1	2
*The information in the planning table i	c for quidance only and door no	t take into account the hot	araganaity of the students

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

Methodologies	
	Description
Lecturing	Exhibition by the teacher of the contents on the subject matter of study, theoretical bases and / or exercise or projects to be developed by the student.
Laboratory practical	Laboratory practical classes: Determination of sensory, chemical and microbiological parameters of quality, composition nutritional, presence of additives, contaminants
Seminars	Personalized and/or group tutorials: student interviews with the course's teaching staff for advice / development of activities of the learning process.

Personalized assis	Personalized assistance			
Methodologies	Description			
Lecturing	The lecturers will anwer the questions posed by the students about the contents of the course, in face-to-face or online tutorials, or by e-mail.			
Laboratory practical	The student will be guided in the acquisition of basic skills and problem solving related to the subject matter of study. The progress of the student will be monitored.			
Seminars	The student receives, in group and/or individually, advice from the teacher on the theoretical and practical concepts of the subject, for the development of the objectives of the course.			

Assessment						
	Description	Qualification	L	Trai earni	ning a ing Re	nd sults
Lecturing	The resolution of problems and practical cases, as well as the autonomous work of the student.	20	A2 A3 A4	B1 B2	C11 C12	D1 D2 D3 D5
Laboratory practical	The performance and results of the internships and the completion of the internship report or questionnaire will be evaluated.	า 20	A2 A3 A4	B1 B2 B3	C11 C12	D1 D2 D3 D5
Objective questions exam	The theoretical knowledge acquired in this course will be evaluated through a test with multiple choice questions.	40	A2 A3 A4	B1 B2	C11 C12	D1 D2 D3 D5
Self-assessment	Test-type questionnaires will be carried out through the teaching platform, so that students can evaluate their degree of acquisition of the subject's competences.	20	A2 A3 A4	B1 B2 B3	C11 C12	D1 D2 D3 D5

#### Other comments on the Evaluation

To pass the course, the student must obtain a grade equal to or greater than 4.5 points out of 10 in the final exam. In case of not reaching this grade, a "Fail" grade will be assigned, with the numerical value of the grade obtained in the final exam.

### Sources of information

**Basic Bibliography** 

A. O. A. C., Official Methods of Analysis (I4th edn). Association of Official Analytical Chemis, Ariington, 1984 FAO/DANIDA,, El pescado fresco: su calidad y cambios de calidad, 1988 FARBER J., DODOS K., **Principles of modified-atmosphere and sous vide product packaging.**, A technopnic Publishing Company Inc., 1995

HEBARD, D. E., Flick G. J., Martin R. E., Occurrence and significance of trimethylamine oxide and its derivates in fish and shellfish. Chemistry and biochemistry of marine food products, Avi Publishing Co. Conneticut, 1992 GOULD,, New methods of preservation P., Blackie Academic and Professiona, 1996

Jae W. Park, Surimi and surimi sea food, 2nd edition, 2005

#### Complementary Bibliography

BEATTY S. A.; N. E. GIBBONS,, The measurement of spoilage of fish, 1937

CASTELL, C. H.; B. SMITH Y N. NEAL., Production of dimethylamine in muscle of several species of gadoid fish during frozen storage, especially in relation to presence of dark muscle, 1971

CASTELL, C. H.; SMITH B. Y DYER, W. J, Simultaneous measurements of trimethylamine and diniethylarnine in fish, and their use for estimating quality of frozen storage gadoid fish, 1974

#### Recommendations

#### Other comments

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

IDENTIFYIN	G DATA			
Food secur	ty of fishery and aquaculture products			
Subject	Food security of			
	fishery and			
	aquaculture			
	products			
Code	V11M085V02304			
Study	Máster			
programme	Universitario en			
	Ciencia y			
	Tecnología de			
	Conservación de			
	Productos de la			
	Pesca			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	5	Mandatory	2nd	1st
Teaching	Spanish			
language	Galician			
Department				
Coordinator	Longo González, María Asunción			
	Avendaño Garcia, Jose Mª			
Lecturers	Calvo Iglesias, Juan			
	Fontán Pérez, Noa			
	Longo González, María Asunción			
	Buiz Blanco, Carlos S			
	Viñuela Rodríguez, José Ángel			
F-mail				
Wob	http://posca.mastar.wobs.uviga.os			
General	In this course. Solf control in the food chain, production	n control logistic	c and accurance aug	lity management
description	and quality cortification will be addressed		s and assurance, qua	inty management
description	and quality certification will be addressed.			
	d Loovning Doculto			
<u>Code</u>	idents know how to apply the knowledge acquired and	their ability to co	lvo probloms in now	or unfamiliar
AZ Mat St	ments within broader (or multidisciplinary) contexts rel	ated to their area	of study	
A3 That ct	idents are able to integrate knowledge and face the co	mploxity of makir	noi study.	n information that
AS mat su	idents are able to integrate knowledge and face the co	othical recoonsibility	litios linkod to the or	nlication of their
being in	icomplete of inflited, includes reflections of social and	ethical responsible	incles initied to the ap	plication of their
Knowled	ige and judgments.			here all all an all and
A5 That sti	idents have the learning skills that allow them to contil	nue studying in a	way that will be large	ely self-alrected or
	nous.			
BI Inat the	e students acquire the comprehension, analysis and sy	nthesis capacities		
B4 Inat th	e students develop the problem-solving abilities of appl	ication of the the	oretical knowledge in	practice.
C13 Assess	the importance of the control and certification of the qu	lality of fishery pr	oducts as a commer	cial weapon and
with a v	new to traceability and food safety.	<u> </u>		<u> </u>
C14 Know th	e food alert management procedures by the competer	nt authority and th	nose responsible for t	he food chain
C15 Know th	e critical variables that determine the viability of a pro	duct or novel pro	cesses. Use tools to c	btain critical
informa	tion for feasibility.			
D1 Ability t	o understand the meaning and application of the gend	er perspective in t	the different fields of	knowledge and
profess	onal practice with the aim of achieving a more just and	l egalitarian socie	ty.	
D2 Sustain	ability and environmental commitment. Equitable, resp	onsible and efficient	ent use of resources.	
D5 Commit	ment to ethics in the profession and in society.			
Expected re	sults from this subject			
Expected rec	ults from this subject			Training and
Expected res				Learning Results
Internret lea	slation on the self-control of fishery products legislatic	n on hygiona lah	eling and food safety	<u></u>
interpret leg	Sidion on the sen-control of fishery products, legislatic	in on nygiene, lau	ching and rood salety	Δ3
				C13
				C14
				D1
				D2
				-

Apply in a practical way the analysis of hazard	Is and critical control poin	ts (HACCP), with the peculia	rities A3
of each type of process.	Į.		A5
			B1
			B4
			C14
			C15
			D1
			D5
Assess the importance of the control and certi	fication of the quality of f	ood products from the sea as	sa A3
commercial weapon and with a view to tracea	bility and food safety.		A5
			B1
			B4
			C13
			DZ DE
Know the management precedures of Food Al	orte by the competent aut	barity and these responsible	Jo for A2
the food chain	erts by the competent au	inonity and those responsible	A3
			81
			B4
			C13
			C14
			C15
			D2
			D5
Actions of the Official Control Laboratories of f	ishery and aquaculture pr	oducts (PPAs).	A2
			A3
			B1
			B4
			C13
			C14
			C15
			D1
			D2
			05
Contents			
ITEM 1. Self-control in the chain of	- Traceability.		
feeding.	- HACCP.		
	- Study of deviations.		
ITEM 2 Container food interactions	- Aspects of practical		
TEM 2. Container-1000 Interactions.	Aspects of Container-	1000 Interactions	hina nraducta
TIEM 3. Standards ESO 9000.	- Application to the pi		ning products.
ITEM 4. Official control of fichary products		s.	
from third countries	from third countries	ery products	
TEM 5. Official control laboratorios of	Official control labora	torioc of	
fishing products	fishing products		
ITEM 6. Official control of fishory products	Official control of fich	ony products	
in the EU.	in the EU.		
Planning			
	Class hours	Hours outside the	Total hours
Lecturing	28	66	94
Case studies	5	12	17
Studies excursion	3	3	6

Seturison22Seminars22Objective questions exam11Self-assessment11\*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

Methodologies	
Descri	ption

Lecturing	Explanation by the lecturer of the contents of the course, theoretical bases and exercises to be developed by the student. Blackboard and audiovisual means will be used.
Case studies	Resolution of cases, doubts and queries both individually or in a small group regarding the follow-up and study of the lessons of the subject.
Studies excursion	Activities of application of knowledge to specific situations and acquisition of basic and procedural skills related to the subject matter of study. They take place in non-academic outdoor spaces. These include field practices, visits to events, research centers, companies, institutions, etc.
Seminars	Personalized and/or group tutorials: student interviews with the course's teaching staff for advice / development of activities of the learning process.

## Personalized assistance Methodologies Description Lecturing The lecturers will answer the questions posed by the students, in face-to-face or online tutorials, or by email. Case studies The student will be guided in the acquisition of basic skills and problem solving related to the subject matter of study. The progress of the student will be monitored. Studies excursion Guidance and advice in a small group by the teacher on the concepts of field practices, company visits, etc. Seminars The student receives, in group and/or individually, advice from the teacher on the theoretical and practical concepts of the subject, for the development of the objectives of the course.

Assessment						
	Description	Qualificatio	n	Trai	ning aı	nd
			L	earni	ng Res	sults
Lecturing	The attendance and participation of the students in the classes, in	20	A2	B1	C13	D1
	the discussion of contents and exercises, will be evaluated.		A3	Β4	C14	D2
					C15	
Case studies	Problem solving and practical cases will be evaluated, as well as the	20	A2	Β1	C13	D1
	student's autonomous work		A3	Β4	C14	D2
					C15	
Objective questions	There will be an exam with multiple choice questions that will	40	_A3	Β4	C13	D1
exam	evaluate the theoretical and practical knowledge acquired in the		A5		C14	D2
	course.				C15	D5
Self-assessment	Test-type questionnaires will be carried out through the teaching	20		Β4	C13	D1
	platform, so that students can evaluate their degree of acquisition of	f	A5		C14	D2
	the subject's competences.				C15	D5

#### Other comments on the Evaluation

To pass the course, the student must obtain a grade equal to or greater than 4.5 points out of 10 in the final exam. In case of not reaching this grade, a "Fail" grade will be assigned, with the numerical value of the grade obtained in the final exam.

### Sources of information

Basic Bibliography

FAO, El Pescado Fresco: su calidad y cambios en su calidad,,

FAO, Sistemas de Calidad e Inocuidad de los alimentos. Manual de Capacitación sobre hygiene de los alimentos y sobre el sistema de análsis de Peligros y de Puntos de Control Críticos,

FAO, Food safety risk analysis,

A. Ruiter, **El pescado y los productos derivados de la pesca. Composición, propiedades nutritivas y estabilidad.**, Editorial Acribia,

WHO,, Training Consideratrions for the Aplication of the Hazard Analysis Critical Control Point System to Food Processing and Manufacturing,

Gobierno Vasco,, Estándar de referencia de los sistemas de autocontrol de empresas alimentarias basados en el APPCC/HACCP,

Complementary Bibliography

Jean-Yves Leveau y Marielle Bouix, Manual Técnico de Higiene, Limpieza y Desinfección,

Ramón Madrid, Juana Mary Madrid, Antonio Madrid, La limpieza y desinfección en las industrias alimentarias, ILE-Julio-Agosto, 33-38, Roy Kirby., HACCP in practique,

Roy Kirby.,, HACCP in practique, Food Control,

Stumbo, C. R., J.R. Murphy, and J. Cochran, Nature of Thermal death time curves for P.A. 3679 and Clostridium botulinum,

Recommendations

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

IDENTIFYIN	G DATA			
Internships				
Subject	Internships			
Code	V11M085V02405			
Study	Máster			
programme	Universitario en			
	Ciencia y			
	Tecnología de			
	Conservación de			
	Productos de la			
	Pesca			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	9	Mandatory	2nd	2nd
Teaching	Spanish			
language	Galician			
Department				
Coordinator	Longo González, María Asunción			
Lecturers	Longo González, María Asunción			
E-mail	mlongo@uvigo.es			
Web	http://pesca_master.webs.uvigo.es			
General	Carry out an internship in a company in the seafood co	nservation secto	or, in order to add	lress specific practical
description	tasks that, based on the knowledge acquired, allow the	m to better und	erstand the prod	uctive environment of
	the Sector in a global context.			
	The student will participate in the activities that are scr	headled by the t	utor, the Masters	s coordinator and the
	the concernation of fishing products	the existing proc	esses in the con	ipany itself related to
Training an	d Learning Results			
Code			· · · · · · ·	
AI Possess	s and understand knowledge that provides a basis or opp	ortunity to be o	riginal in the dev	elopment and / or
	tion of ideas, often in a research context.			
AZ That Sti	Idents know now to apply the knowledge acquired and t	heir ability to so	ive problems in r	new or unfamiliar
	idents are able to integrate knowledge and face the con	neu lo their area	n of study.	and on information that
AS Mat Sti heing in	adents are able to integrate knowledge and race the con	thical responsibilities	ilities linked to th	sed off information that,
knowler	dae and judaments	chical responsibility		ie application of their
A4 That stu	idents know how to communicate their conclusions, and	the knowledge	and ultimate rea	sons that sustain them
to spec	alized and non-specialized audiences in a clear and una	mbiguous way.		sons that sustain them,
A5 That stu	idents have the learning skills that allow them to continu	ue studving in a	way that will be	largely self-directed or
autonor	nous.	j j	· <b>,</b> · · · ·	5-,
B1 That the	e students acquire the comprehension, analysis and syn	thesis capacities	5.	
B2 That stu	udents develop oral and written communication skills in	the two co-officia	al languages of a	utonomy (Spanish and
Galiciar	n).			
B3 That the	e students develop the skills to perform experimental wo	ork, handling of r	material and biol	ogical elements and
related	programs.			
B4 That the	e students develop the problem-solving abilities of applie	cation of the the	oretical knowled	ge in practice.
B5 That the	e students develop the abilities of teamwork, enriched b	y the pluridiscipl	linarity.	
B6 That the	e students develop the ability of elaboration, presentatic	on and defense o	of works or report	ts.
C1 Know a	nd differentiate the main fishing and aquaculture specie	s of commercial	interest in our co	ountry, with its main
biologic	al characteristics.			
C2 Know th	ne parameters of safety and characterization of the qual	ity of fishery pro	ducts, as well as	their possible
toxicolo	gical risks, and the legislation applicable to such produc	ts.		
C3 Acquire	basic knowledge about laboratory analytical control of f	ïshery products,	, including the bi	otic and abiotic
contam	inants potentially present in them.			
C4 Know th	ne main environmental aspects that affect the processing	g and conservati	ion of seafood pr	oducts: control and
treatme	ent of liquid effluents, sludge, soil and atmospheric emiss	sions. Applicable	e legislation.	
C5 Acquire	the knowledge of business management in industries of	the sector.	<u> </u>	
C6 Acquire	knowledge about marketing and marketing for fishery a	ind aquaculture	products.	
C/ Know th	ne operations and basic technologies used in the conserv	ation and transf	rormation of sea	products by cold, heat
or othe	physical-chemical methods: retrigeration, freezing, ster	ilization, pasteu	rization, semi-pro	eservation.
Co Study t	ne different forms of preparation and packaging systems	for sea product	is treated by cold	a, neat or other
atmocr	s, but traditionally and new technological orientations:	restructured pro	Juucis, prepared	uisties, mouilled
	neres, myn pressures, ell. and the organization of production in the inductry of fick	any and aguacy	lture producte tr	ested by cold best and
other n	racesses Production methods and their logistics	iei y anu aquacu	iture products th	eated by cold, field dilu
	seesses, i rouaction methods and their logistics.			

- C10 Determine the criteria and procedures for the control of the quality of the products of the fishing and of the containers and packaging used in its commercial circuit. Know the procedures for its analytical control and defect detection.
- C11 Approach to quality control of each of the production lines of fishery products. Basic knowledge of product quality management.
- C12 Acquire basic knowledge and interpret the legislation applicable to the facilities where the handling and treatment of fishery products is carried out along the commercial chain: hygiene, labeling, food safety, plant self-control (APPCC), etc.
- C13 Assess the importance of the control and certification of the quality of fishery products as a commercial weapon and with a view to traceability and food safety.
- C14 Know the food alert management procedures by the competent authority and those responsible for the food chain
- C15 Know the critical variables that determine the viability of a product or novel processes. Use tools to obtain critical information for feasibility.
- D1 Ability to understand the meaning and application of the gender perspective in the different fields of knowledge and professional practice with the aim of achieving a more just and egalitarian society.
- D2 Sustainability and environmental commitment. Equitable, responsible and efficient use of resources.
- D3 Autonomous work capacity and decision making.
- D4 Creativity, initiative and entrepreneurial spirit.
- D5 Commitment to ethics in the profession and in society.

Expected results from this subject	
Expected results from this subject	Training and
	Learning Results
Address specific practical tasks that, based on the knowledge acquired, allow a better understanding of	A1
the productive environment of the sector in a global context.	A2
	A3
	A4
	A5
	B1
	B2
	B3
	B4
	B5
	B6
	C1
	C2
	C3
	C4
	C5
	C6
	C7
	C8
	C9
	C10
	C11
	C12
	C13
	C14
	C15
	DI
	D2
	D3
	D4
	D5

#### Contents

Topic

External internships in an industry in the canning Address specific practical tasks that, based on the knowledge acquired, allow a better understanding of the productive environment of the sector in a global context.

Planning			
	Class hours	Hours outside the classroom	Total hours
Practicum, External practices and clinical practices	220	0	220
Seminars	3	0	3
Report of practices, practicum and external practice	s 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
Practicum, External practices and clinical practices	The students will be integrated into an industry in the seafood preservation sector. The students will learn and have an overview of all the modules of the production process of the industry where they carry out the internship.
	The students will be assigned a task, within the various modules that the production process involves. The activity of the companies with which the collaboration agreements have been reached allows students to acquire competencies in the procedures related to the various processes of conservation, safety, quality and technology, environmental management, marketing and innovation and sustainability.
Seminars	The activity carried out within the industry will be followed by the tutors of the master's degree and by a person in charge of the company appointed to supervise and guide the students in the tasks assigned.

Personalized assistance					
Methodologies	Description				
Practicum, External practices and clinical practices	Advise students on issues and difficulties that arise during their external internships.				
Seminars	An academic responsible person and another from the company will be assigned, to supervise and advise the student's work, and a contact will be maintained with the persons in charge of the Master.				

Assessment					
	Description	Qualification	Tr	aining a	and
			Lear	ning Re	esults
Practicum, External practices and clinical practices	The activity carried out will be supervised and evaluated by the tutors designated for this purpose (academic and company tutor). The grade for the course will be obtained from the report issued by the tutor in the company on the activity carried out (70% of the tota grade) and the internship report that each student must submit at the end of the internship (30% of the total grade).	100 A A A ا A	1 B 2 B 3 B 4 B 5 B 8	1 C1 2 C2 3 C3 4 C4 5 C5 6 C6 7 7 8 0 0 0 10 0 11 0 12 0 13 0 14 0 15	D1 D2 D3 D4 D5

Other comments on the Evaluation

ources of information	
asic Bibliography	
omplementary Bibliography	

#### Recommendations

#### Other comments

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

IDENTIFYIN	NG DATA				
Final Disse	ertation				
Subject	Final Dissertation				
Code	V11M085V02406		·		
Study	Máster		·		
programme	Universitario en				
	Ciencia y				
	Tecnología de				
	Conservación de				
	Productos de la				
	Pesca				
Descriptors	ECTS Credits	Choose	Year	Quadmester	
	10	Mandatory	2nd	2nd	
Teaching	Spanish				
language	Galician				
Department					
Coordinator	Longo González, María Asunción				
Lecturers	Longo González, María Asunción				
E-mail	mlongo@uvigo.es				
Web	http://pesca_master.webs.uvigo.es				
General	Development by the students of a work of theor	etical and/or experime	ntal content rela	ated to the industry of	
description	conservation of fishing products. The work will k	e of an individual natu	re, supervised b	by professors of the	
	master's degree and aimed at evaluating the co	mpetences associated	with it.		
Training an	nd Learning Results				
Code					
A1 Possess	s and understand knowledge that provides a basi ation of ideas, often in a research context	s or opportunity to be o	original in the de	evelopment and / or	
A2 That st	tudents know how to apply the knowledge acquire	d and their ability to so	lve problems ir	new or unfamiliar	
environ	nments within broader (or multidisciplinary) conte	xts related to their area	a of study.		
A3 That stu	tudents are able to integrate knowledge and face	the complexity of maki	ng judgments b	ased on information that,	
being ir	being incomplete or limited, includes reflections on social and ethical responsibilities linked to the application of their				
knowle	edge and judgments.				
A4 That stu	tudents know how to communicate their conclusio	ns, and the knowledge	and ultimate re	easons that sustain them,	
to spec	to specialized and non-specialized audiences in a clear and unambiguous way.				
A5 That stu	That students have the learning skills that allow them to continue studying in a way that will be largely self-directed or				
autonoi	omous.				
	a aku dan ka ang dina ka ang nang nahan atan ang buata a	بملطاء مسمع ملم مطلعين بمالك	-		

B1 That the students acquire the comprehension, analysis and synthesis capacities.

B2 That students develop oral and written communication skills in the two co-official languages of autonomy (Spanish and Galician).

B3 That the students develop the skills to perform experimental work, handling of material and biological elements and related programs.

B4 That the students develop the problem-solving abilities of application of the theoretical knowledge in practice.

B5 That the students develop the abilities of teamwork, enriched by the pluridisciplinarity.

B6 That the students develop the ability of elaboration, presentation and defense of works or reports.

C1 Know and differentiate the main fishing and aquaculture species of commercial interest in our country, with its main biological characteristics.

C2 Know the parameters of safety and characterization of the quality of fishery products, as well as their possible toxicological risks, and the legislation applicable to such products.

C3 Acquire basic knowledge about laboratory analytical control of fishery products, including the biotic and abiotic contaminants potentially present in them.

C4 Know the main environmental aspects that affect the processing and conservation of seafood products: control and treatment of liquid effluents, sludge, soil and atmospheric emissions. Applicable legislation.

C5 Acquire the knowledge of business management in industries of the sector.

C6 Acquire knowledge about marketing and marketing for fishery and aquaculture products.

C7 Know the operations and basic technologies used in the conservation and transformation of sea products by cold, heat or other physical-chemical methods: refrigeration, freezing, sterilization, pasteurization, semi-preservation.

C8 Study the different forms of preparation and packaging systems for sea products treated by cold, heat or other methods, both traditionally and new technological orientations: restructured products, prepared dishes, modified atmospheres, high pressures, etc.

C9 Understand the organization of production in the industry of fishery and aquaculture products treated by cold, heat and other processes. Production methods and their logistics.

C10 Determine the criteria and procedures for the control of the quality of the products of the fishing and of the containers and packaging used in its commercial circuit. Know the procedures for its analytical control and defect detection.

C11 Approach to quality control of each of the production lines of fishery products. Basic knowledge of product quality management.

- C12 Acquire basic knowledge and interpret the legislation applicable to the facilities where the handling and treatment of fishery products is carried out along the commercial chain: hygiene, labeling, food safety, plant self-control (APPCC), etc.
- C13 Assess the importance of the control and certification of the quality of fishery products as a commercial weapon and with a view to traceability and food safety.
- C14 Know the food alert management procedures by the competent authority and those responsible for the food chain
- C15 Know the critical variables that determine the viability of a product or novel processes. Use tools to obtain critical information for feasibility.
- D1 Ability to understand the meaning and application of the gender perspective in the different fields of knowledge and professional practice with the aim of achieving a more just and egalitarian society.
- D2 Sustainability and environmental commitment. Equitable, responsible and efficient use of resources.

D3 Autonomous work capacity and decision making.

- D4 Creativity, initiative and entrepreneurial spirit.
- D5 Commitment to ethics in the profession and in society.

#### Expected results from this subject

Expected results from this subject	Training and
	Learning Results
Search for detailed information on the selected topic. Consultations and selection of bibliographical	A1
sources.	A2
	A3
	A4
	A5
	B1
	B2
	B3
	B4
	B5
	B6
	C1
	C2
	C3
	C4
	C5
	C6
	C7
	C8
	C9
	C10
	C11
	C12
	C13
	C14
	D1
	D2
	D3
	D4
	D5

Work development. Laboratory work, theory, pilot plant or information in industries of the sector.	A1
	A2
	A3
	A4
	A5
	B1
	B2
	B3
	B4 P5
	B6
	C1
	C2
	C3
	C4
	C5
	C6
	C7
	C8
	C9
	C10
	C12
	C13
	C15
	D1
	D2
	D3
	D4
	D5
Oral and written presentation of a final report of the work done	A1
	A2
	A3 A4
	Δ5
	B1
	B2
	B3
	B4
	B5
	B6
	C1
	C2
	C5
	C6
	C7
	C8
	C9
	C10
	C11 C12
	C12
	C13
	C15
	D1
	D2
	D3
	D4
	D5
Contents	

- Selection of the topic to be studied.
- Search and selection of bibliographical sources
- Laboratory work, pilot plant or information in industries of the sector.
- Advice with the coordinators of the module or the personnel from
- industry.
- Preparation of reports.
- Presentation and defense of the work.

#### Planning Class hours Hours outside the Total hours classroom Project based learning 200 200 0 Presentation 2 8 10 Project 2 38 40 \*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

Methodologies	
	Description
Project based learning	Elaboration of a written document where it is reflected: content of the document, depth of the topic, adequate planning and sequencing, management of bibliographic sources, as well as presentation of results, conclusions and personalized opinions. Ideas of advance and future perspectives of the subject.

Personalized assistance		
Methodologies	Description	
Project based learning	The student will be guided in the acquisition of basic skills and problem solving related to the subject matter of study. The progress of the student will be monitored.	
Tests	Description	

Project

Guide the student in the writing of the work. elaboration of objectives, results and conclusions.

#### Assessment Qualification Description Training and Learning Results PresentationPresentation by the students before an academic jury of the work carried out, 30 A1 B1 C1 D1 individually or in groups. A2 B2 C2 D2 Α3 **B**3 C3 D3 Β4 A4 C4 D4 A5 B5 C5 D5 B6 C6 C7 C8 C9 C10 C11 C12 C13 C14 C15 Project For the evaluation of the work, the content of the written document will be 70 A1 Β1 C1 D1 A2 B2 taken into account. Depth of the topic, adequate planning and sequencing, C2 D2 Β3 management of adequate bibliographical sources, as well as presentation of Α3 D3 С3 results, conclusions and personalized opinions will be assessed. Α4 Β4 C4 D4 The guality of the project will be evaluated taking into account the evaluation A5 B5 C5 D5 of the jury (50% total qualification) and that of the tutor/s (20% total B6 C6 qualification). C7 C8 C9 C10 C11 C12 C13 C14 C15

#### Other comments on the Evaluation

#### Recommendations

#### **Other comments**

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