



## Information about the subject

**Degree:** Bachelor of Degree in Marine Sciences

**Faculty:** Faculty of Veterinary Medicine and Experimental Sciences

**Code:** 270208 **Name:** Sea Food Technology

**Credits:** 6,00 **ECTS Year:** 2, 3, 4 **Semester:** 1

**Module:** Optional Itinerary: Marine Biotechnology

**Subject Matter:** Sea Food Technology **Type:** Elective

**Department:** Oceanography and Environment

**Type of learning:** Classroom-based learning

**Languages in which it is taught:** Spanish

### Lecturer/-s:

OPM6

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## Module organization

### Optional Itinerary: Marine Biotechnology

| Subject Matter          | ECTS | Subject                 | ECTS | Year/semester   |
|-------------------------|------|-------------------------|------|---|
| Marine Biotechnology    | 6,00 | Marine Biotechnology    | 6,00 | 2, 3, 4/1   |
| Instrumental Techniques | 6,00 | Instrumental techniques | 6,00 | This elective is not offered in the academic year 23/24 |
| Sea Food Technology     | 6,00 | Sea Food Technology     | 6,00 | 2, 3, 4/1   |
| Genetic Engineering     | 6,00 | Gene Techniques         | 6,00 | This elective is not offered in the academic year 23/24 |
| Food Technology         | 6,00 | Food Technology II      | 6,00 | This elective is not offered in the academic year 23/24 |
| Food Hygiene and Safety | 6,00 | Food Hygiene and Safety | 6,00 | This elective is not offered in the academic year 23/24 |

## Recommended knowledge

No specific prior knowledge is required



## Learning outcomes

At the end of the course, the student must be able to prove that he/she has acquired the following learning outcomes:

- R1 The student identifies the main seafoods and knows how and where they are produced.
- R2 The student knows the composition of seafood and the biochemical and microbial changes subsequent to its capture.
- R3 The student knows and applies the fundamentals of food engineering to the design and operation of processing facilities.
- R4 The student recognizes the environmental and socio-economic implications of the agri-food processing industry for fishery and aquaculture products.
- R5 The student develops HACCP plans for seafood processing and distribution facilities.
- R6 The student evaluates the quality and food safety of seafood products through various procedures.
- R7 The student prepares reports and makes valid judgements on various aspects of the study of seafood production technology.
- R8 The student relates the theoretical and practical contents through works and tasks entrusted.
- R9 The student understands conceptually and values the importance of studying the technology of seafood production in the context of science and society today, and of oceanography in particular.



## Competencies

Depending on the learning outcomes, the competencies to which the subject contributes are (please score from 1 to 4, being 4 the highest score):

| BASIC |  | Weighting |   |   |   |
|-------|--|-----------|---|---|---|
|       |  | 1         | 2 | 3 | 4 |
| CB2   | Students are able to apply knowledge to their work in a professional way and have the competences enabling them to state and defend views and opinions as well as perform problem-solving tasks in their field of study. |           |   |   | X |
| CB3   | Students are able to collect and interpret relevant data (generally in their field of study) and give opinions that involve reflection on relevant social, scientific or ethical issues.                                 |           |   | X |   |
| CB5   | Students develop the necessary learning skills to undertake further studies with a high level of autonomy.   |           |   |   | X |

| GENERAL |  | Weighting |   |   |   |
|---------|--|-----------|---|---|---|
|         |  | 1         | 2 | 3 | 4 |
| CG1     | Capacity to analyze and synthesize   |           |   |   | X |
| CG2     | Capacity to organize and plan  |           |   |   | X |
| CG3     | Mastering Spanish oral and written communication   |           |   |   | X |
| CG5     | Knowing and applying Basic ITC skills related to marine science  |           |   | X |   |
| CG6     | Capacity to manage information (capacity to look for and analyze information coming from different types of sources) |           |   |   | X |
| CG7     | Decision making  |           |   |   | X |
| CG8     | Capacity to work in interdisciplinary and multidisciplinary team   |           |   |   | X |
| CG10    | Critical and self-critical capacity  |           |   |   | X |



|      |   |   |   |  |   |
|------|---|---|---|--|---|
| CG11 | Capacity to learn                       |   |   |  | X |
| CG12 | Capacity to adapt to new situations     |   |   |  | X |
| CG16 | Capacity to apply theoretical knowledge |   |   |  | X |
| CG17 | Research skills                         | X |   |  |   |
| CG18 | Sensibility to environmental issues.    |   | X |  |   |

| SPECIFIC | Weighting   |   |   |   |
|----------|---|---|---|---|
|          | 1   | 2 | 3 | 4 |
| CE8      | Identifying and analyzing new problems and proposing solution strategies  |   |   | X |
| CE10     | Knowing how to use planning, designing and implementing research tools while surveying and assessing results                | X |   |   |
| CE11     | Knowing how to do fieldwork and laboratory experiments in a safe and responsible way, promoting teamwork                    | X |   |   |
| CE13     | Looking for and assessing different kinds of marine resources   |   |   | X |
| CE19     | Deeply understanding operating systems of maritime orientated companies, identifying their problems and proposing solutions |   |   | X |



## Assessment system for the acquisition of competencies and grading system

| Assessed learning outcomes | Granted percentage | Assessment method   |
|----------------------------|--------------------|---|
|                            | 50,00%             | Written test with theoretical and practical questions   |
|                            | 30,00%             | Delivery of guided assignments, whose objectives and contents will be proposed by the teacher |
|                            | 10,00%             | Laboratory test   |
|                            | 10,00%             | Oral presentation   |

### Observations

Forms of evaluation:

The written test will consist of a multiple choice test, only one of the answers is true (wrong answers will subtract) and short questions that will include both aspects seen in class, as well as possible seminars and visits.

The different works, whose objectives and contents will be proposed by the teacher will consist of a serie of group or individual work activities and rapid classroom tests that will be developed throughout the practical classroom classes that are carried out. Recovery will only be allowed in case of excused absence to class, otherwise it will count as not delivered and will be 0 in it.

The practical laboratory test will be carried out in the laboratory or in the classroom after finishing it. Not going to the practice session proposal will prevent the student from doing the exam. Within this assessment, the student's attitude in the laboratory will also be taken into account. If it were suspended it would be recovered in the second examination session.

Classroom practical classes have no possibility of recovery in exams. In the group work exhibition, the content of the presentation and the exhibition will be assessed both individually and collectively.



## MENTION OF DISTINCTION:

According to Article 22 of the Regulations governing the Evaluation and Qualification of UCV Courses, the mention of "Distinction of Honor" may be awarded by the professor responsible for the course to students who have obtained, at least, the qualification of 9 over 10 ("Sobresaliente"). The number of "Distinction of Honor" mentions that may be awarded may not exceed five percent of the number of students included in the same official record, unless this number is lower than 20, in which case only one "Distinction of Honor" may be awarded.

## Learning activities

The following methodologies will be used so that the students can achieve the learning outcomes of the subject:

- M1 Teacher presentation of contents, analysis of competences, explanation and in-class display of skills, abilities and knowledge.
- M2 Group work sessions supervised by the professor. Case studies, diagnostic tests, problems, field work, computer room, visits, data search, libraries, on-line, Internet, etc. Meaningful construction of knowledge through interaction and student activity.
- M3 Activities carried out in spaces with specialized equipment.
- M4 Supervised monographic sessions with shared participation.
- M5 Application of multidisciplinary knowledge.
- M6 Personalized and small group attention. Period of instruction and/or guidance carried out by a tutor to review and discuss materials and topics presented in classes, seminars, readings, papers, etc.
- M8 Set of oral and/or written tests used in initial, formative or additive assessment of the student.
- M9 Group preparation of readings, essays, problem-solving, seminars, papers, reports, etc. to be presented or submitted in theoretical, practical and/or small-group tutoring sessions. Work done on the university e-learning platform ([www.plataforma.ucv.es](http://www.plataforma.ucv.es))
- M10 Student's study: Individual preparation of readings, essays, problem-solving, seminars, papers, reports, etc. to be presented or submitted in theoretical, practical and/or small-group tutoring sessions. Work done on the university e-learning platform ([www.plataforma.ucv.es](http://www.plataforma.ucv.es)).



## IN-CLASS LEARNING ACTIVITIES

|   | LEARNING OUTCOMES                     | HOURS        | ECTS        |
|---|---------------------------------------|--------------|-------------|
| ON-CAMPUS CLASS<br>M1                   | R1, R2, R3, R4, R6, R9                | 30,00        | 1,20        |
| PRACTICAL CLASSES<br>M2                 | R2, R3, R5, R6, R7, R8                | 10,00        | 0,40        |
| LABORATORY<br>M3                        | R2, R6, R8                            | 10,00        | 0,40        |
| SEMINAR<br>M4                           | R9                                    | 3,00         | 0,12        |
| GROUP PRESENTATION OF ASSIGNMENTS<br>M5 | R2, R3, R4, R6, R8                    | 2,00         | 0,08        |
| TUTORIAL<br>M6                          | R1, R2, R3, R4, R5, R6, R7,<br>R8, R9 | 3,00         | 0,12        |
| ASSESSMENT<br>M8                        | R1, R2, R3, R4, R5, R6, R7,<br>R8, R9 | 2,00         | 0,08        |
| <b>TOTAL</b>                            |                                       | <b>60,00</b> | <b>2,40</b> |

## LEARNING ACTIVITIES OF AUTONOMOUS WORK

|                         | LEARNING OUTCOMES                     | HOURS        | ECTS        |
|-------------------------|---------------------------------------|--------------|-------------|
| GROUP WORK<br>M9        | R1, R2, R3, R4, R6, R7, R8,<br>R9     | 20,00        | 0,80        |
| INDEPENDENT WORK<br>M10 | R1, R2, R3, R4, R5, R6, R7,<br>R8, R9 | 70,00        | 2,80        |
| <b>TOTAL</b>            |                                       | <b>90,00</b> | <b>3,60</b> |





## Description of the contents

Description of the necessary contents to acquire the learning outcomes.

### Theoretical contents:

| Content block   | Contents   |
|---|--|
| I.- INTRODUCTION: FOOD TECHNOLOGY OF MARINE ORIGIN. LEGISLATION AND FOOD SECURITY | <p>Unit 1. Food technology. Live marine resources that can be used as food. Production techniques: extractive fishing and aquaculture. Industries derived from fishing</p> <p>Unit 2 Legislation related to the marine food industry</p> <p>Unit 3 Food security in foods of marine origin: design of HACCP plans.</p> <p>Unit 4. Chemical and nutritional properties of foods of marine origin. Post-capture and sacrifice manipulation, biochemistry and microbiology.</p>   |
| II.- PROCESSING TECHNOLOGY OF MARINE ORIGIN FOODS.                                | <p>Unit 5. Basic concepts of food technology. Final consumer, requirements of processed foods. Sensory evaluation of marine foods</p> <p>Unit 6. Introduction to the forms of conservation and presentation to consumption. Labeled</p> <p>Unit 7. Main techniques of food analysis: nutritional composition (determination of humidity, ashes, proteins, fat) and food safety (microbiological analysis)</p> <p>Unit 8. Conservation techniques by cold: fresh, chilled and frozen foods.</p> <p>Unit 9. Conservation techniques through salting and drying.</p> <p>Unit 10. Conservation techniques through smoking.</p> <p>Unit 11. Conservation techniques through heat treatments: pasteurization, sterilization. Preparation of semi-preserves and preserves</p> <p>Unit 12. Development of products based on fish muscle. Precooked and cooked foods. By-products</p> <p>Topic 13. Biotechnology applied to the food industry</p> |



## Organization of the practical activities:

|      | Content   | Place      | Hours |
|------|---|------------|-------|
| PR1. | SA nalysis of water retention capacity (CRA), moisture, ash and protein | Laboratory | 2,00  |
| PR2. | Sensory analysis  | Laboratory | 2,00  |
| PR3. | Determination of fat percentage and enzymatic browning. Part I          | Laboratory | 2,00  |
| PR4. | Determination of fat percentage and enzymatic browning. Part II         | Laboratory | 2,00  |
| PR5. | Development of a product of marine origin                               | Laboratory | 2,00  |

## Temporary organization of learning:

| Block of content  | Number of sessions | Hours |
|---|--------------------|-------|
| I.- INTRODUCTION: FOOD TECHNOLOGY OF MARINE ORIGIN. LEGISLATION AND FOOD SECURITY | 7,00               | 14,00 |
| II.- PROCESSING TECHNOLOGY OF MARINE ORIGIN FOODS.                                | 23,00              | 46,00 |



## References

BIBLIOGRAPHY: ALASALVAR C. 2011. Handbook of seafood quality, safety and health applications. WILEY-BLACKWELL. BENITEZ M. 2013. Tecnología del pescado. IC. BONET M. 2013. Elaboración de congelados de productos de la pesca. IC. CAMPOS R. 2013. Acondicionado del pescado y marisco. IC. CANOURA J. 2013. Elaboración de masas, pastas, precocinados y cocinados de pescado. ICEVANS, JUDITH A. 2018. Ciencia y Tecnología de los alimentos congelados. ACRIBIA FELLOWS, PETER. 2018. Tecnología del procesado de los alimentos: principios y práctica. ACRIBIA HAARD N. 2000. Seafood enzymes. CRC PRESS. HALL G. 2001. Tecnología del procesado del pescado. ACRIBIA HALL G. 2011. Fish processing: sustainability and new opportunities. WILEY-BLACKWELL. HORST-DIETER T. 2001. Fundamentos de la tecnología de los alimentos. ACRIBIA LUTEN J.B. 2003. Quality of fish from catch to consumer. WANENINGEN. LUTEN J.B. 2006. Seafood research from fish to dish. WANENINGEN. MADRID A., MADRID JM., MADRID R. 1993. Tecnología del pescado y productos derivados. MUNDIPRENSA. MARQUEZ A. 2013. Recepción, almacenaje, y expedición de productos de la pesca. IC. MATEOS-APARICIO, I. 2017. Aditivos alimentarios. DEXTRAMORCILLO, G., CORTÉS, E., GARCÍA, J. 2013. Biotecnología y alimentación. UNED. NOLLET L. 2010. Handbook of seafood and seafood product analysis. CRC PRESS. NOLLET L. 2000. Food analysis by HPLC. CRC PRESS. SANTANA I.M. 2013. Elaboración de conservas de pescado y marisco. IC. SEN D.P. 2005. Advances in fish processing technology. ALLIED PUBLISHERS. SHAHIDI F. 2004. Seafood quality and safety. SCIENCE TECH PUBLISHING. SHAHIDI F. 2006. Maximizing the value of marine by-products. WOODHEAD VV.AA. 2006. APPCC aplicado a la comercialización de la pesca. IDEAS PROPIAS. WEBS OF INTEREST: AESAN: [http://www.aecosan.msssi.gob.es/AECOSAN/web/home/aecosan\\_inicio.htm](http://www.aecosan.msssi.gob.es/AECOSAN/web/home/aecosan_inicio.htm) FAO: <http://www.fao.org/home/en/OMS>: <https://www.who.int/es/EFSA>: <https://www.efsa.europa.eu/en/ANFACO-CECOPESCA>: <http://www.anfaco.es/es/index.php> MAPA: <https://www.mapa.gob.es/es/pesca/temas/default.aspx>



## Addendum to the Course Guide of the Subject

Due to the exceptional situation caused by the health crisis of the COVID-19 and taking into account the security measures related to the development of the educational activity in the Higher Education Institution teaching area, the following changes have been made in the guide of the subject to ensure that Students achieve their learning outcomes of the Subject.

**Situation 1: Teaching without limited capacity** (when the number of enrolled students is lower than the allowed capacity in classroom, according to the security measures taken).

In this case, no changes are made in the guide of the subject.

**Situation 2: Teaching with limited capacity** (when the number of enrolled students is higher than the allowed capacity in classroom, according to the security measures taken).

In this case, the following changes are made:

### 1. Educational Activities of Onsite Work:

All the foreseen activities to be developed in the classroom as indicated in this field of the guide of the subject will be made through a simultaneous teaching method combining onsite teaching in the classroom and synchronous online teaching. Students will be able to attend classes onsite or to attend them online through the telematic tools provided by the university (videoconferences). In any case, students who attend classes onsite and who attend them by videoconference will rotate periodically.

In the particular case of this subject, these videoconferences will be made through:

☒ Microsoft Teams

☒ Kaltura



## **Situation 3: Confinement due to a new State of Alarm.**

In this case, the following changes are made:

### **1. Educational Activities of Onsite Work:**

All the foreseen activities to be developed in the classroom as indicated in this field of the guide of the subject, as well as the group and personalized tutoring, will be done with the telematic tools provided by the University, through:

☒ Microsoft Teams

☒ Kaltura

Explanation about the practical sessions:

In cases where the type of practice allows it, an adaptation will be carried out. Otherwise, there will be an active seminar with the content to be covered in practice.



## 2. System for Assessing the Acquisition of the competences and Assessment System

### ONSITE WORK

#### Regarding the Assessment Tools:

☐

The Assessment Tools will not be modified. If onsite assessment is not possible, it will be done online through the UCVnet Campus.

☒

The following changes will be made to adapt the subject's assessment to the online teaching.

| Course guide               |                      | Adaptation  |                     |
|----------------------------|----------------------|---|---------------------|
| Assessment tool            | Allocated percentage | Description of the suggested changes  | Platform to be used |
| Written test               | 50%                  | reduction of the percentage of the final evaluation to 40%  | Microsoft Teams     |
| Delivery of directed works | 10%                  | Study of simple transformation and alteration processes, as well as analysis of results. The tasks carried out will represent 20% of the evaluation | Microsoft Teams     |

The other Assessment Tools will not be modified with regards to what is indicated in the Course Guide.

#### Comments to the Assessment System:



Universidad  
**Católica de  
Valencia**  
San Vicente Mártir

# Course guide

Year 2023/2024  
270208 - Sea Food Technology

