



IDENTIFYING DATA

Techniques to Study Marine Organisms

Subject	Techniques to Study Marine Organisms			
Code	V02M098V01108			
Study programme	(*)Máster Universitario en Bioloxía Mariña			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	3	Mandatory	1st	1st
Teaching language	Spanish			
Department				
Coordinator	Molist García, María del Pilar			
Lecturers	Galindo Dasilva, Juan González Sotelo, María del Carmen Molist García, María del Pilar Pasantes Ludeña, Juan José Suarez Alonso, Maria del Pilar			
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General description	It is a essentially practical subject, in which students will be familiar with histological, biochemical and genetic techniques. These techniques will be used in studying tissues, protein and gene expression, genetic markers, biomolecules purification and immunological techniques. Its main aim is that the student knows and evaluates the potentiality of a variety of techniques for the study of marine organisms.			

Competencies

Code	
A1	(*)Posuír e comprender coñecementos que acheguen unha base ou oportunidade de ser orixinais no desenvolvemento e/ou aplicación de ideas, adoito nun contexto de investigación.
A2	(*)Que os estudantes saiban aplicar os coñecementos adquiridos e a súa capacidade de resolución de problemas en contornos novos ou pouco coñecidos dentro de contextos máis amplos (ou multidisciplinares) relacionados coa súa área de estudo.
A3	(*)Que os estudantes sexan capaces de integrar coñecementos e se enfrontar á complexidade de formular xuízos a partir dunha información que, sendo incompleta ou limitada, inclúa reflexións sobre as responsabilidades sociais e éticas vinculadas á aplicación dos seus coñecementos e xuízos.
A4	(*)Que os estudantes saiban comunicar as súas conclusións, e os coñecementos e razóns últimas que as sustentan, a públicos especializados e non especializados dun xeito claro e sen ambigüidades.
A5	(*)Que os estudantes posúan as habilidades de aprendizaxe que lles permitan continuar estudando dun xeito que terá que ser, en grande medida, autodirixido e autónomo.
B1	Utilización de criterios y métodos científicos en el planteamiento y resolución de problemas aplicando los conocimientos adquiridos
B2	Búsqueda, análisis e integración de información a partir de diferentes fuentes y capacidad para su interpretación y evaluación
B3	Aprendizaje de diversas técnicas y métodos analíticos tanto en el medio natural como en el laboratorio
B4	Desarrollo de habilidades en el manejo y tratamiento de herramientas, matemáticas, estadísticas e informáticas
C2	Conocimiento de la diversidad de organismos marinos y sus estrategias adaptativas
C8	Conocimiento y manejo de la metodología de investigación, de las técnicas muestreo e instrumentales y de análisis de datos aplicados al medio marino
C11	Estudios de dinámica poblacional, mejora genética y selección de stocks en pesquerías, acuicultura y programas de repoblación
D1	Desarrollo de las capacidades comprensivas, de análisis y síntesis
D2	Desarrollo de la capacidad de razonamiento crítico y autocrítico
D4	Desarrollo de la capacidad para actualizar el conocimiento de forma autónoma

Learning outcomes	
Expected results from this subject	Training and Learning Results
Application of histological, biochemical and genetic techniques to the study of marine organisms	A1 A2 A3 A4 A5 B1 B2 B3 B4 C2 C8 C11 D1 D2 D4

Contents	
Topic	
1.- Histological techniques	1a.- Processed of samples for microscopic study: applications of the microscopy. 2b.- Immunohistochemistry and application of the histochemical techniques using lectins.
2. Genetic techniques	2a.- Detection of the genetic variation. 2b.- Genetic markers and their applications 2c.- Molecular resources in the internet
3.- Biochemical techniques	3a.- Extraction, separation and quantification of biomolecules. 3b.- Spectrophotometric electrophoretic, chromatographic, fluorometric and of enzymatic determination.
4.- Identification of species	4.- Use of molecular tools for the identification of fisheries products.

Planning			
	Class hours	Hours outside the classroom	Total hours
Laboratory practical	15	34.5	49.5
Presentation	2	8	10
Seminars	1.5	0	1.5
Problem solving	1.52	0	1.52
Lecturing	4	8.48	12.48

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

Methodologies	
	Description
Laboratory practical	The techniques proposed in the content section will be carried out. In advance, a script will be delivered to the students explaining the basis and objectives to develop each technique. During or at the end of the development of the protocol students will make problems and solve practical cases .
Presentation	A practical problem with a combination of techniques will be proposed to the students who will have to choose the techniques that are best suited to solve that problem and, explain the basis of their choice.
Seminars	There will take place two 2 group tutorials, in which the doubts and questions will be ask about different aspects of the subject. The teacher will guide in the elaboration of personal works.
Problem solving	there will be a problem solving test via internet
Lecturing	The theoretical aspects and the usefulness of the laboratory techniques will be treated in the master sessions.

Personalized assistance	
Methodologies Description	
Seminars	In the group tutorials will raise doubts and questions of the subject. The student will be advised to carry out their work

Assessment						
	Description	Qualification	Training and Learning Results			
Laboratory practical	Continuous evaluation by means of the follow-up of the student's work in the laboratory.	20	A2	B1	C8	
Presentation	Continuous evaluation through the delivery and/or exhibition of works, results, reports, etc.	30	A1	B2		D1
Seminars	Evaluation of the monitoring of the performance of the work in the different parts of the subject.	10				D2
Problem solving	Evaluation of the learning process through written and oral exams, which may include test-type exams, diverse format test tests, reasoning questions, subject and short questions, problem solving and case studies	30	A2	B1	C8	D1
Lecturing	Continuous evaluation by means of the follow-up of the student's work.	10	A3	B2	C11	
			A3	B3		D4

Other comments on the Evaluation

Sources of information

Basic Bibliography

Montuenga Badía, L., Esteban Ruiz, F.J., Calvo González, A., **Técnicas en histología y biología celular + StudentConsult en español**, 2ª, Elsevier-Masson, 2014

Perera, J., Tormo, A., García, L., **Ingeniería genética. Preparación, análisis, manipulación y clonaje de DNA.**, 1ª, Síntesis DL., 2009

Complementary Bibliography

Bergmeyer, H.U., **Methods of Enzymatic Analysis**, 3ª, Academic Press., 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 METHODOLOGIES ==

* Teaching methodologies that are maintained

All teaching methodologies are maintained except for laboratory practices

* Teaching methodologies that are modified

Laboratory practices would be done online through videos and explanations from the teacher using remote control.

* Non-attendance mechanism for student attention (tutorials)

Not applicable

* Modifications (if applicable) of the content to be taught

Not applicable the contents would be the same

=== ADAPTATION OF THE EVALUATION ===

* Tests already carried out

The evaluation of the learning process is mostly online with exams based on problem solving and summary of research articles. The weight would be the same.

* Pending tests that are maintained

All.

* Evidence that is modified

In the case of attending practical classes, the obligation to attend remains but in this case online.

All the methodologies will be taught telematically through the use of the utilities integrated in the Remote Campus of the University of Vigo if necessary.
