



IDENTIFYING DATA

Fishing

Subject	Fishing			
Code	V10G060V01703			
Study programme	(*)Grao en Ciencias do Mar			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Mandatory	4th	1st
Teaching language	Spanish			
Department				
Coordinator	González Castro, Bernardino			
Lecturers	González Castro, Bernardino			
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Web				
General description	This course aims to serve as an introduction to the dynamics of exploited populations and to the basic methodologies used in their assessment and management.			

Competencies

Code	
A1	Students have demonstrated knowledge and understanding in a field of study that builds upon their general secondary education, and is typically at a level that, whilst supported by advanced textbooks, includes some aspects that will be informed by knowledge of the forefront of their field of study
A2	Students can apply their knowledge and understanding in a manner that indicates a professional approach to their work or vocation, and have competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study
A3	Students have the ability to gather and interpret relevant data (usually within their field of study) to inform judgments that include reflection on relevant social, scientific or ethical issues
A5	Students have developed those learning skills that are necessary for them to continue to undertake further study with a high degree of autonomy
C4	To know the basic techniques to sample the water column, organisms, sediments and sea bottom, as well as the surveying methods for dynamic and structural variables
C10	To know the problems and the basic principles of sustainability in relation to the use and exploitation of the marine environment
C15	To recognize and implement good scientific practice in measurement and experimentation, both in the field and in the laboratory
C29	Skill in the practical use of models and in the incorporation of new data for their validation, improvement and development
C33	Fisheries control
D1	Analysis and synthesis ability
D6	Problem management and solving skills

Learning outcomes

Expected results from this subject	Training and Learning Results		
Understand the population processes that affect the dynamics of living resources	A3	C10 C33	D1
Estimate parameters of interest for marine fisheries resources exploitation	A2	C15 C29	D6
Understand the basic methods of fisheries resource assessment	A2	C4 C33	D1
Understand and apply basic methods of fitting mathematical models for parameter estimation, population dynamics and assessment of marine living resources	A1 A2 A5	C15 C29	D6

Develop skills to use basic fisheries computer programs

Contents

Topic	
Characterization of marine fisheries resources	Types of resources. Marine areas of interest in the exploitation of resources. Degree of exploitation of marine living resources.
The fishing process	Fishing gears, boats and methods. Selectivity of fishing gears
The unit stock	Population and stock. Population parameters. Characterization of management units. Estimation of abundance of exploited stocks
Reproduction	Maturation and fecundity. Estimation of maturity. Age and size of first maturity. Estimation of fecundity.
Recruitment	Estimation of recruitment. Stock-recruitment relationship. Population dynamics and stock-recruitment relationships.
Age and growth	Concept of cohort. Determination of age. Length-weight relationship. Allometry and isometry. Condition indices. Mathematical expressions of growth. Age-length keys.
Growth parameters	The von Bertalanffy growth model. Estimation of growth parameters: length-frequency analysis, separation of cohorts, size-at-age analysis, length increments analysis. Conversion of length to age.
Mortality	Survivorship curves. Mortality rates. Natural and fishing mortalities. Fishing effort. Capturability. Catch: Catch equations, Catch rates. Estimation of total, natural and fishing mortalities. Estimation of catchability.
Population dynamics and assessment models of fish stocks	Cohort Analysis: Virtual Population Analysis, Pope's Cohort Analysis. Biomass dynamic models. Yield and biomass per recruit models.
Fisheries Management	Biological reference points. Harvest strategies. Harvest tactics. International organizations and resource management.
Methodologies of parameter estimation	Estimation with Excel. Estimation with FISAT. Application of an age-structured model of harvested populations.

Planning

	Class hours	Hours outside the classroom	Total hours
Lecturing	32	48	80
Laboratory practical	4	2	6
Practices through ICT	12	6	18
Problem solving	4	4	8
Mentored work	0	34	34
Essay questions exam	3	0	3
Problem and/or exercise solving	1	0	1

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

Methodologies

	Description
Lecturing	Oral presentation of the contents of the subject using the blackboard and computer presentations.
Laboratory practical	Size selectivity of a dredge for shellfish resources.
Practices through ICT	Learning and application of numerical methodologies for resolution of parameters and resolution of quantitative problems related to the contents of the subject. Learning and use of basic programs used in the evaluation of marine living resources. Simulation of the dynamics of an exploited population and calculation of Reference Points for fisheries management.
Problem solving	Solution of numerical problems related to the methods explained in the lectures and practices.
Mentored work	Reading of a scientific publication related to the contents of the subject and answering several questions about it.

Personalized assistance

Methodologies	Description
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Lecturing	It will available mainly in the tutoring schedule, except for unforeseen circumstances. It is recommended that the student contact the teacher about when to carry out the tutoring. Tutoring hours: Monday and Wednesday from 15:00 to 18:00 h. Outside of these hours according to availability of the teacher.
Laboratory practical	It will available mainly in the tutoring schedule, except for unforeseen circumstances. It is recommended that the student contact the teacher about when to carry out the tutoring. Tutoring hours: Monday and Wednesday from 15:00 to 18:00 h. Outside of these hours according to availability of the teacher.
Practices through ICT	It will available mainly in the tutoring schedule, except for unforeseen circumstances. It is recommended that the student contact the teacher about when to carry out the tutoring. Tutoring hours: Monday and Wednesday from 15:00 to 18:00 h. Outside of these hours according to availability of the teacher.
Mentored work	It will available mainly in the tutoring schedule, except for unforeseen circumstances. It is recommended that the student contact the teacher about when to carry out the tutoring. Tutoring hours: Monday and Wednesday from 15:00 to 18:00 h. Outside of these hours according to availability of the teacher.
Problem solving	It will available mainly in the tutoring schedule, except for unforeseen circumstances. It is recommended that the student contact the teacher about when to carry out the tutoring. Tutoring hours: Monday and Wednesday from 15:00 to 18:00 h. Outside of these hours according to availability of the teacher.

Assessment					
	Description	Qualification	Training and Learning Results		
Lecturing	Written examination on the contents of the master sessions	50	A1 A2 A5	C10 C33	D1
Laboratory practical	Written examination on the contents of the laboratory practices.	5	A1 A2	C4 C15	
Practices through ICT	Written examination on the contents of the computer room sessions.	10	A2 A5	C15 C29	
Problem solving	Written examination of numerical problems of the subject.	20	A1 A2 A5		D6
Mentored work	Reading of a scientific work on content related to the subject and answering in writing a question form about it.. This task is voluntary, if the student does not do it, his qualification will be based exclusively on the written exam.	15	A2 A3	C33	D1

Other comments on the Evaluation

The "Laboratory practices" and "Practices in computer rooms" are shown separately by requirement of this platform, but their evaluation and scoring is joint, not making a distinction between both. In other words, there will be a single evaluation of "Practices" whose Qualification represents 15% of the total qualification.

The tutored work is voluntary and must be delivered before December 14, 2020 at 13:00 h. The mark of the tutored work will be preserved for the second call. If the student does not do it, the qualification of the subject will be derived exclusively from the rest of the sections, in the following way "Master lesson" 58.3%, Practices ("Laboratory practices" + "Practices in computer classroom") 25% and " Problem solving "16.7%. The mark of the tutored work will be preserved for the second call.

Students are strongly requested to fulfil a honest and responsible behaviour. It is considered completely unacceptable any alteration or fraud (i.e., copy or plagiarism) contributing to modify the level of knowledge and abilities acquired in exams, evaluations, reports or any kind of teacher's proposed work. Fraudulent behaviour may cause failing the course for a whole academic year. An internal dossier of these activities will be built and, when reoffending, the university rectorate will be asked to open a disciplinary record

Sources of information

Basic Bibliography

King, M., **Fisheries biology, assessment and management**, Blackwell Publishing, 2007

Sparre, P. y Venema, S. C., **Introducción a la evaluación de recursos pesqueros tropicales. Part 1**, FAO, 1997

Jennings, S.; Kaiser, M. J. and Reynolds, J. D., **Marine Fisheries Ecology**, Blackwell Science, 2001

Complementary Bibliography

Hilborn, R. and Hilborn, U., **Overfishing. What everyone needs to know**, Oxford University Press, 2012

Recommendations

Subjects that it is recommended to have taken before

Fish and shellfish biology/V10G060V01902

Other comments

To carry out the exams the student must have a calculator able to perform linear regression.

Contingency plan

Description

=== EXCEPTIONAL PLANNING ===

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

=== ADAPTATION OF THE METHODOLOGIES ===

* Teaching methodologies maintained

In the case of a blended learning situation, all methodologies are maintained, incorporating the devices provided by the Faculty of Marine Sciences so that non physically present students have synchronous access to the teacher's lectures.

In the distance learning situation, all the methodologies are maintained with the exception of the "Laboratory practices"

Teaching will be carried out through the Campus Remoto, synchronously and keeping the student's groups established for the classroom-based learning

* Teaching methodologies modified

In the distance learning situation, the "Laboratory practical" will be replaced by "Practices through ICT". This change affects one of the three practices in the subject. The practices involved will be partially modified, replacing an initial sampling for obtaining the working data with a computer simulation, and complementing the virtual presentation of the practice with images concerning the sampling process used in the face-to-face situation.

* Non-attendance mechanisms for student attention (tutoring)

1) The student should request tutoring by email.

2) The teacher will indicate to the student, also by email, the date and hour for tutoring, using his virtual desk on Campus Remoto.

* Modifications (if applicable) of the contents

Not needed

* Additional bibliography to facilitate self-learning

None

* Other modifications

In the case of the blended or distance learning situations, the student should have a computer with Excel.

=== ADAPTATION OF THE TESTS ===

The assessment methodologies and qualifications will be kept the same in the three situations, with the exception of where to carry them (in a classroom or by means of computer-based questionnaires in the distance learning situation).

* Tests already carried out

Test XX: [Previous Weight 00%] [Proposed Weight 00%]

...

* Pending tests that are maintained

Test XX: [Previous Weight 00%] [Proposed Weight 00%]

...

* Tests that are modified

[Previous test] => [New test]

* New tests

* Additional Information
