Universida_de_Vigo

IDENTIFYING DATA
Fisheries

Subject	Fisheries			
Code	V10G061V01405			
Study programme	Grado en Ciencias del Mar			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Mandatory	4th	1st
Teaching language	Spanish			
Department				
Coordinator	González Castro, Bernardino			
Lecturers	González Castro, Bernardino			
E-mail	bcastro@uvigo.es			
Web	http://https://moovi.uvigo.gal/course/view.php?id=11583			
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.			

Training and Learning Results

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
C11	Apply the knowledge and techniques acquired to the characterization and sustainable use of living resources and marine ecosystems.
D1	Develop the search, analysis and synthesis of information skills oriented to the identification and resolution of problems.
D5	Sustainability and environmental commitment. Equitable, responsible and efficient use of resources.

Expected results from this subject

Expected results from this subject	Training and Learning Results		
Understand the population processes that affect the dynamics of living resources		C11	D1 D5
Understand the basic methods of fisheries resource assessment	A1	C11	D1
Understand and apply basic methods of fitting mathematical models for parameter estimation, population dynamics and assessment of marine living resources	A1	C11	D1 D5
Develop skills to use basic fisheries computer programs	A1	C11	

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. Conversión 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	60	92
Laboratory practical	4	4	8
Practices through ICT	12	17	29
Problem solving	4	12	16
Essay questions exam	2	0	2
Problem and/or exercise solving	1	0	1
Objective questions exam	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
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.

Personalized assistance

Methodologies	Description
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: Thursday, from 11:00 to 13:00 h and from 16:00 to 18:00 h and Friday, from 11:00 to 13:00 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: Thursday, from 11:00 to 13:00 h and from 16:00 to 18:00 h and Friday, from 11:00 to 13:00 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: Thursday, from 11:00 to 13:00 h and from 16:00 to 18:00 h and Friday, from 11:00 to 13:00 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: Thursday, from 11:00 to 13:00 h and from 16:00 to 18:00 h and Friday, from 11:00 to 13:00 h. Outside of these hours according to availability of the teacher.

Assessment

Description	Qualification	Training and Learning Results

Lecturing	There will be 3 written exams in which the theoretical contents of the subject will be evaluated	70	A1	C11	D1 D5
Laboratory practical	Written examination on the contents of the laboratory practices.	5	A1	C11	D1 D5
Practices through ICT	Written examination on the contents of the computer room sessions.	10	A1	C11	D1 D5
Problem solving	Written exam in which the ability to apply the population parameter estimation and evaluation methodologies explained in the theoretical and practical classes will be assessed.	15	A1	C11	D1 D5

Other comments on the Evaluation

Students who choose to take the global assessment will not be able to take any test (of any part ofthe subject), corresponding to continuous assessment, that is done after the date indicated by the Dean's Office to express the type of assessment chosen.

1) Continuous evaluation

The subject will be considered passed if the sum of the scores of the different tests to be taken is equal to or greater than 5 points, otherwise the whole of the Second Opportunity exam will have to be taken.

1.1- Evaluation of the theory

The evaluation of the "master classes" will be carried out in three written exams throughout the course, two of them within the hours of theory of the subject and one on the date of the First Opportunity exam. In each of the first two exams, all the theoretical contents prior to 5 calendar days from the date of the test will be evaluated, whether or not they have been previously evaluated. The first test is worth 2.0 points and the second 3.5. The 3rd exam, to be carried out on the date of the overall evaluation of the First Opportunity, will have a value of 1.5 points and will cover the entire theory.

1.2- Evaluation of Practices

The evaluation of the "Laboratory Practices" will be carried out at the same time as the first exam of the "Lectures". It will have a maximum score of 0.5 points.

The evaluation of the "ICT-supported practices" will be carried out on the date assigned for the final evaluation of the First Opportunity. Its maximum score will be 1.0 points.

1.3- Evaluation of Problems

It will be carried out on the date of the First Opportunity final exam. The value of this part of the matter will be 1.5 points.

2) Overall evaluation

It will be carried out through a written exam with three parts: theory (maximum score=7), practices (maximum score=1.5) and problems (maximum score=1.5). The subject will be considered approved if the sum of the scores of the different parts of the exam is equal to or greater than 5 points. In the First Opportunity, only those students who have chosen this type of evaluation at the time will be able to carry it out.

In the Second Opportunity, it can be done by all students who have not passed the subject in the First Opportunity (whether in the continuous or global evaluation modality).

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., **Introduccón 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

Statistics/V10G061V01107

Marine Ecology/V10G061V01206

Other comments

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