



IDENTIFYING DATA

Biological oceanography I

Subject	Biological oceanography I			
Code	V10G061V01301			
Study programme	Grado en Ciencias del Mar			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Mandatory	3rd	1st
Teaching language	#EnglishFriendly Galician			
Department				
Coordinator	Lastra Valdor, Mariano			
Lecturers	Aranguren Gassis, María Lastra Valdor, Mariano			
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General description This subject insight in the study of a number of coastal ecosystems, located in the sea-land interface, from a ecological approach. This includes beaches, rocky shore, saltmarshes, estuaries, seagrass, coastal lagoons, dunes, reefs and mangroves. The fundamental aim will be to understand the ecosystem functions, to analyze faunal assemblages and to describe the human impact that these environments face in an scenario of global change.

English Friendly subject: International students may request from the teachers:
a) resources and bibliographic references in English, b) tutoring sessions in English, c) exams and assessments in English.

Training and Learning Results

Code	
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
A4	Students can communicate information, ideas, problems and solutions to both specialist and non-specialist audiences
A5	Students have developed those learning skills that are necessary for them to continue to undertake further study with a high degree of autonomy
B2	Plan and execute surveys in the field and laboratory work, applying basic tools and techniques for sampling, data acquisition and analysis in the water column, sea bottom and marine substratum.
B3	Recognize and implement good practices in measurement and experimentation, and work responsibly and safely both in field surveys and in the laboratory.
B4	Manage, process and interpret the data and information obtained both in the field and in the laboratory.
B5	Develop, implement and write basic or applied projects in oceanography from a multidisciplinary perspective.
C1	know at a general level the fundamental principles of sciences: Mathematics, Physics, Chemistry, Biology and Geology.
C9	Acquire basic knowledge about the structural and functional organization and the evolution of marine organisms.
C10	Know the biological diversity and functioning of marine ecosystems.
C11	Apply the knowledge and techniques acquired to the characterization and sustainable use of living resources and marine ecosystems.
D2	Acquire the ability to learn autonomously, continuously and collaboratively, organizing and planning tasks over time.
D3	Understanding the meaning and application of the gender perspective in different fields of knowledge and in professional practice with the aim of achieving a more just and equal society.
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
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Through theoretical contents, practical, exits of field and the work of investigation, at the end of the course the student will have to have purchased the necessary knowledges that allow him interpret the operation of the coastal ecosystems (estuaries, beaches, coastal lagoons, etc), and his interaction with the antrophic activities in the open ocean.	A3	B2	C1	D2
	A4	B3	C9	D3
	A5	B4	C10	D5
		B5	C11	

Contents

Topic	
1. Estuaries	1.1. Introduction 1.2. Salinity and substrate 1.3. Vegetation and macrofauna 1.4. The communities of Petersen 1.5. The alimentary chain
3. Rocks	2.1. General appearances 2.2 Adaptations to the physical stress: temperature, waves, burial, .. 2.3. Coasts warmed up, exposed and moderately exposed. 2.4. Subtidal rocks 2.5. Control factors 2.6. The food chain
4. Beaches	3.1. Introduction 3.2. Types of Beaches 3.3. Zonation 3.4. Flora and fauna
5. Coastal lagoons	4.1. General characteristics 4.2. Lagoon organisms 4.3. Ecology of the coastal lagoons 4.4. Primary and secondary production
6. Dune systems	5.1. General characteristics 5.2. Characteristics of ecological importance 5.3. Dune vegetation 5.4. Fauna 5.5. Food chains
7. Mangroves	6.1. Distribution and physical conditions 6.2. Zonation 6.3. Ecological importance
8. Coral reefs	7.1. The paper of the zooxanthellae 7.2. Factors that limit the growth of the reefs 7.3. Geographic distribution and types of coral reefs 7.4. Productivity of the reef 7.5. Biological interactions and mutualism
9. Vertical structure in open ocean and coastal waters: biology of the superficial ocean.	8.1 Zonation of the oceanic region 8.2. Phytoplankton and zooplankton 8.3. Food webs

Planning

	Class hours	Hours outside the classroom	Total hours
Seminars	7	7	14
Laboratory practical	15	0	15
Studies excursion	0	10	10
Lecturing	25	37.5	62.5
Mentored work	0	34.5	34.5
Objective questions exam	1	10	11
Essay	1	2	3

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

Methodologies

	Description
Seminars	They will divide the groups in subgroups of 3-4 people. Each subgroup will prepare a work to choose between the subjects offered by the professor at the beginning of the course. Each student will have to involve clearly in all or some of the facets of the work. The works will be directed during the destined hours to the seminars. The oral exhibition will have a length of 20 minutes for the oral presentation and 5 minutes for the round of questions of the professor and of the rest of students. The presentation will come accompanied by an archive in computer support (PDF) that will send to the professor in dates fixed previously to the presentation.

Laboratory practical	With the samples taken during the field trip to the sea, the students will learn the separation, identification and headcounts of pertaining organisms to distinct groups of the benthos. With the table of data obtained will work the statistical section from univariate analysis, bivariate and multivariate.
Studies excursion	They will conduct in the subject two field trips: 1) Sail along the the estuary of Vigo in the ship Mytilus, for the collecting benthic samples with quantitative dredges (Van-Veen). 2) Field trip to Aguiño (Ribeira, A Coruña)
Lecturing	They will present and they will argue theoretical contents that they will be evaluated in a final examination.
Mentored work	The works of investigation will be driving in group through the seminars. The students that belong to the same group will have to assist to same group of seminar.

Personalized assistance

Methodologies	Description
Lecturing	Theoretical classes on the subjects of the subject. Its content will be moved to the platform TEMA once that each subject have finalised. Students willing so could attend personal tutorials to solve doubts and/or uncertainties, which will mainly take place during the timetables indicated. To better optimise the procedure, the student is requested to previously contact his/her teacher with reasonable anticipation. Schedule of tutorials: Tuesday and Thursday of 17:00 to 18:00 h.
Laboratory practical	3 groups of laboratory of 20 students roughly.
Seminars	3 groups of seminars, of roughly 15 students, and that will serve to give support to the works of investigation developed by the students.

Assessment

	Description	Qualification	Training and Learning Results
Seminars	They will divide the groups in subgroups of 3-4 people. Each group will prepare a scientific work chosen from among the proposed by the own students or by the professor at the beginning of the course. The works will be supported during the destined hours to the seminars (small groups 2.5h). The exhibition of the works will take place in the date established in the calendar of the Faculty, and will have a length of 20 minutes for the oral presentation and 5 minutes for the round of questions of the professor and of the rest of students. The presentation will come accompanied by an archive in computer support (*powerpoint) as well as an archive in PDF that will send to the professor in dates fixed in the calendar of *entregables of the Faculty.	30	A3 B2 C1 D2 A4 B3 C9 D3 A5 B4 C10 D5 B5 C11
Laboratory practical	The practical assistance of laboratory and to the field excursions will be mandatory. Will have to deliver a fascicle of practices (maximum 1500 words) in which they appear reflected the tasks, results and observations so much of the practices of laboratory as of the exits of field. It will evaluate the participation in the practices, the rigour in the work of sampling and laboratory, the aptitude for the work in team and the capacity to elaborate and interpret results.	30	A3 B2 C1 A4 B3 C9 A5 B4 C10 B5 C11
Lecturing	Examination written. They will make questions that show the level of understanding purchased by the students to the long of the matter, so much in the theoretical classes, as practical, seminars and field work.	40	A3 B2 C1 D2 A4 B3 C9 D3 A5 B4 C10 D5 B5 C11

Other comments on the Evaluation

To pass the subject it is necessary to pass each of the three tests (master sessions, research work and laboratory practices).

In the second call, there will be a written exam corresponding to the subject taught and the criteria established in the REGULATION ON ASSESSMENT, QUALIFICATION AND TEACHING QUALITY AND THE STUDENT LEARNING PROCESS of the University of Vigo will be followed.

The date, time and place of the evaluation tests, presentations and deliverables will be published on the official website of the Faculty of Marine Sciences: <http://mar.uvigo.es/alumnado/examenes/>

Students who take this subject are required to behave responsibly and honestly. Any form of fraud (copying or plagiarism) aimed at distorting the level of knowledge and skills achieved in any type of test, report or work is considered inadmissible. Fraudulent conduct may mean failing the subject for a full course. will keep an internal record of these actions so that, in case of recidivism, request the opening of a disciplinary file to the rector.

- **Global assessment option:** The application for this evaluation option must be submitted in the time and manner determined by the Center, which will be published prior to the academic start. Given the experimental nature of the practices, attendance at them is mandatory to be eligible for this evaluation option. **Failure to attend the practices, with no justified cause invalidates this possibility, as well as the opportunity for extraordinary evaluation (2nd opportunity).**

Sources of information

Basic Bibliography

Moore P.G. & R. Seed, **The ecology of Rocky coast**, First Edition, Columbia University Press, 1986

Keninich Michael J., **Coastal Lagoons: Critical habitats of Environmental Change**, First Edition, CRC Press Taylor and Francis Group, 2010

Hogarth Peter J., **The Biology of Mangroves**, First Edition, Oxford University Press, 1999

Kjerfve B., **Coastal Lagoon processes**, First Edition, Elsevier science B.V., 1994

Sorokin Y. I., **Coral Reef Ecology**, Springer, 1995

Barnes R.S.K., **An introduction to marine ecology**, Second edition, Blackwell Science, 1999

Nordstrom, K.F., Psuty, N. & Carter, B., **Coastal dunes**, Wiley & sons, 1990

Nybakken, James W., **Marine biology : an ecological approach**, Fourth edition, Pearson Benjamin Cummings, 2005

Brown, A.C. & McLachlan, **Ecology of sandy shores**, Elsevier, 1990

Complementary Bibliography

Knox G.A., **The ecology of seashores**, CRC Press, 2001

D. Bertness et al, **Marine community ecology and conservation**, Second edition, Sunderland, Massachusetts : Sinauer Associates, 2014

Levinton J.S., **Marine Biology: function, biodiversity, ecology**, Oxford University Press, 2001

Rupert F.G. Ormond, John D. Gage, and Martin V. Angel, **Marine biodiversity : patterns and processes**, First Edition, Cambridge University Press, 1997

Raffaelli D.G., **Intertidal ecology**, Second edition, Chapman & Hall, 1999

Little, C. & Kitching, J.A, **The Biology of rocky shores**, Second edition, Oxford University, 2009

Adam, P., **Saltmarsh ecology**, Cambridge University press, 2010

Barreiro F., Gómez M., López J., Lastra M. & la Huz R., **Coupling between macroalgal inputs and nutrients outcrop in exposed sandy beaches**, Hydrobiologia, 700: 73-84, 2013

Vila-Concejo A. & Kench P.S., **Storms in Coral Reefs: Processes and Impacts**, Coastal Storms, pp.127-149, 2017

Ansell, A.D, Gibson, R.N., Barnes, M.,, **Oceanography and Marine Biology, An annual review**, Aberdeen University Press, 1995

Shing Yip Lee et al., **Ecological role and services of tropical mangrove ecosystems: a reassessment**, Global Ecology and Biogeography 23 , 726-743, 2014

Recommendations

Subjects that continue the syllabus

Biological oceanography II/V10G061V01306

Subjects that are recommended to be taken simultaneously

Physiology of marine organisms/V10G061V01305

Geological oceanography I/V10G061V01303

Subjects that it is recommended to have taken before

Biology: Biology I/V10G061V01101

Biology: Biology 2/V10G061V01106

Biochemistry/V10G061V01201

Marine botany/V10G061V01202

Marine zoology/V10G061V01210