Teaching Guide				
Identifying Data				2021/22
Subject (*)	Botanical Geography: Geobotany		Code	610G02026
Study programme	Grao en Bioloxía			
Descriptors				
Cycle	Period	Year	Type	Credits
Graduate	2nd four-month period	Fourth	Optional	6
Language	SpanishGalician			
Teaching method	Face-to-face			
Prerequisites				
Department	Bioloxía			
Coordinador	Cremades Ugarte, Javier	E-mail	javier.cremades@udc.es	
Lecturers	Cremades Ugarte, Javier Fagúndez Díaz, Jaime	E-mail	javier.cremades@udc.es jaime.fagundez@udc.es	
Web				
General description	Geobotany and Plant Geography are eminently integrative sciences that aim at recognising and studying the relationships between plant communities and the environment they live in. In this course we will focus on the factors (present and historical) that determine the distribution of plants in Earth and also on the methods used to study them. We will also try to understand how plant communities work, paying special attention to the relationships among plants (autoecology) and plant communities (synecology). Finally, we will analyse some of the most relevant plant and algae communities growing in Galicia and the Iberian Peninsula.			

Contingency plan	Three different scenarios are considered in this contingency plan: (i) Adoption of a hybrid teaching method (Scenario 1), (ii) adoption of a distance learning method under a complete lockdown (Scenario 2) and full face to face teaching but with capacity limitations in the spaces assigned to the activities (Scenario 3). Scenario 1. All fieldwork activities that require students transportation will be cancelled unless all Health and Safety regulations can be fulfilled. If cancelled, the percentage of the final grade assigned to these activities will be transferred to the final objective test. A hybrid teaching method will be adopted for keynote lectures following the system approved by the Faculty of Sciences. Scenario 2 1. Modifications to the contents No changes will be necessary. 2. Methodologies *Teaching methodologies that are maintained All methodologies will be kept unless they require that students work outdoors (fieldwork and case study). In that case, this activities will be cancelled (fieldwork) or transformed (case study). *Teaching methodologies that are modified Keynote lectures: They will take place on an online environment using TEAMS. Case study: all parts that require fieldwork will be substituted by vegetation data analysis using data provided by the teachers. Laboratory practicals: They will be merged with the case study. They will also be related to the analysis of vegetation and plant chorology data. 3. Mechanisms for personalized attention to students *Moodle *Email *Teams Students will be able to use any of these tools to communicate with the teachers, with no specific temporalization. Moodle and Teams will be used by the teacher to make materials available to students. 4. Modifications in the evaluation The final objective test will take place through Moodle or Microsoft Forms. The percentage of the final grade assigned to fieldwork activities (5%) and the laboratory practicals (5%) will be transferred to the final objective test and the case studies, respectively. The final percentages will be as follows: Final objective test: 55% of the total grade Case studies: 45% of the final grade *Evaluation observations: All observations made in the ordinary teaching guide remain valid. 5. Modifications to the bibliography or webgraphy No modifications are made. Scenario 3. Additional spaces will be assigned to the different activities. Some students will stay with the teacher and others will move to the new space. The students in the additional classroom will follow the session through TEAMS. In the case of laboratory practices, if the capacity is surpassed, groups will be split.

Study programme competences	
Code	Study programme competences
A1	Recoñecer distintos niveis de organización nos sistemas vivos.
A2	Identificar organismos.
A4	Obter, manexar, conservar e observar especímenes.
A6	Catalogar, avaliar e xestionar recursos naturais.
A11	Identificar e analizar material de orixe biolóxica e as súas anomalías.
A19	Analizar e interpretar o comportamento dous seres vivos.
A20	Muestrear, caracterizar e manexar poboacións e comunidades.
A22	Describir, analizar, avaliar e planificar o medio físico.
A24	Xestionar, conservar e restaurar poboacións e ecosistemas.
A27	Dirixir, redactar e executar proxectos en Bioloxía.
A29	Impartir coñecementos de Bioloxía.
A30	Manexar adecuadamente instrumentación científica.
A31	Desenvolverse con seguridade nun laboratorio.
A32	Desenvolverse con seguridade no traballo de campo.
B1	Aprender a aprender.
B2	Resolver problemas de forma efectiva.
B3	Aplicar un pensamento crítico, lóxico e creativo.
B4	Traballar de forma autónoma con iniciativa.
B5	Traballar en colaboración.
B6	Organizar e planificar o traballo.
B7	Comunicarse de maneira efectiva nunha contorna de traballo.
B8	Sintetizar a información.
B9	Formarse unha opinión propia.
B12	Adaptarse a novas situacións.
C1	Expresarse correctamente, tanto de forma oral coma escrita, nas linguas oficiais da comunidade autónoma.
C3	Utilizar as ferramentas básicas das tecnoloxías da información e as comunicacións (TIC) necesarias para o exercicio da súa profesión e para a aprendizaxe ao longo da súa vida.
C4	Desenvolverse para o exercicio dunha cidadanía aberta, culta, crítica, comprometida, democrática e solidaria, capaz de analizar a realidade, diagnosticar problemas, formular e implantar solucións baseadas no coñecemento e orientadas ao ben común.

Learning outcomes			
Learning outcomes	Study programme competences		
- Understanding the relationship between plants and algae and their environment.	A1 A19 A22 A27 A29	B1 B4 B8	
- Knowing the diversity of terrestrial and marine plant/algae communities.	A1 A2 A19 A27 A29	B1 B4	

- Acquiring skills for the observation, description and identification of plant/algae communities.	A1 A2 A6 A11 A20 A22 A27 A29 A30 A32	B1 B2 B3 B4 B7 B8	C1 C3
- Acquiring skills for the critical management of bibliography and other sources of information.	A27	B1 B4 B8 B9	C3
- Learning basic field and laboratory procedures for the reconnaisance and inventory of plant/algae communities.	A1 A2 A4 A6 A20 A22 A27 A29 A30 A31 A32	B1 B2 B3 B4 B5 B6 B7 B8 B12	
- Encourage students to further research and study Plant Geography as an integrative science essential to their development as field biologists.		B1 B3 B9	C4
- Understanding the diversity of plant/algae communities in their surroundings and their great floristic and biogeographic value.	A1 A24 A27 A29	B1 B9	C4

Contents	
Topic	**Sub-topic**
Lectures 1: Introduction	1. Geobotany and Plant Geography. Links with other biological sciences.
Lectures 2: Phytochorology and Phytocoenology (Plant Geography and Ecology)	2. Plant geographical distribution areas; typology. Cosmopolitism. Edemicity. Migration routes and relict elements. Chorology. Molecular methods in the study of plant chorology and biogeography. 3. Biogeographic areas. Typology of land phytocoenosis (plant communities). The Holarctic Kingdom. Delimitation and bioclimatic characterization. Biogeographic units in the North Atlantic. Oceanographic delimitation and characterization. 4. Vegetation structure. Physical structure; vertical and horizontal structure. Biological structure. Vegetation dynamics. Plant succession and vegetation series. Potential vegetation (climax community). Degradation and secondary succession. Progressive and regressive series. 5. Methodology for the study and classification of plant communities. Historic background. Physiognomic method. Sigmatism.

Lectures 3: Land vegetation	6. The Holarctic Kingdom. Vegetation of the Eurosiberian, Mediterranean and Macaronesian regions. 7. The Iberian Peninsula. Eurosiberian region; chorological provinces. Delimitation and bioclimatic characterization. Relevant and characteristic plant communities. Mediterranean region; chorological provinces. Delimitation and bioclimatic characterization. Relevant and characteristic plant communities. 8. Vegetation in Galicia; characterization. Forests, characteristics and phytosociology. Class Pino-Juniperetea. Class Querco-Fagetea. Class Quercetea ilicis. 9. Forests, characteristics and phytosociology. Class Cytisetea scopario-striatii. Class Calluno-Ulicetea and Class Cisto-Lavanduletea. 10. Plants at the margins. Coastline vegetation. Hygrophilous and hydrophylous vegetation. Saxicolous vegetation. Ruderal plant communities.
Lectures 4: Introduction to marine vegetation	11. Vegetation in the sea. Introduction, main features and differences with the land. Divisions in the marine environments. Ecological factors that influence on the distribution of the marine phytobenthos. Physical, chemical and biological factors affecting the marine phytobenthos. 12. Phytobenthonic ecology. Biological forms, life cycles and adaptations to the marine environment. Main features of the phytobenthonic communities. 13. Biogeography of marine organisms. Vertical and horizontal dimensions in the distribution of marine vegetation. Succession in marine plant communities. 14. Benthic marine vegetation in the North Atlantic and the Mediterranean. Benthic vegetation in Galicia. Coastline typology and main vegetation units.
Seminars	- Introduction to the analysis of floristic inventories. - Ordination and classification of inventories from marine (algae) and land plant communities. - Analysis of the physical, biological and chorological structure in marine (algae) and land plant communities. - Methodology of phenological studies.
Laboratory sessions	- Field sessions to work in the recognison and in situ analysis (floristic inventories) of plant and algae communities. - Lab sessions working on the identification of the samples collected in the field.
Case studies	- Comprehensive study of the flora and vegetation of a previously selected territory. - Phenological studies on selected plants from "Monte da Fraga"

Planning				
Methodologies / tests	Competencies	Ordinary class hours	Student?s personal work hours	Total hours
Case study	A1 A2 A4 A6 A11 A19 A20 A22 A24 A27 A29 A30 A31 A32 B1 B2 B3 B4 B5 B6 B7 B8 B9 B12 C1 C3 C4	3	40	43
Field trip	A32 B1 B2 B3 B5 B6 B7	12	0	12
Laboratory practice	A2 A4 A11 A29 A30 A31 B1 B4 B5 B7 C3	6	0	6
Guest lecture / keynote speech	A1 A19 A22 A24 A27 A29 B1 B3 B4 B7 C3	21	52	73

Seminar	A6 A19 A27 A29 B1 B5 B6 B7 B8 C3	7	7	14
Personalized attention		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	
Methodologies	**Description**
Case study	The students (in pairs or small groups) will identify and mapthe different plant communities in an area chosen by the teachers. Subsequently, they will write a report including all their findings as well as a complete inventory of the different communities. This report will be submitted as the final task of the course.
Field trip	Short fieldwork sessions will be conducted in nearby areas practice the different basic methods of vegetation analysis. Special attention will be paid to frequent vegetation types in Galicia: forests, coastal shrublands, etc.
Laboratory practice	The students will use the laboratory sessions for the study and identification of the samples taken while conducting their case study.
Guest lecture / keynote speech	The teachers will introduce the basic concepts of the course presentations and other resources that will be available to the students.
Seminar	During the seminars, the students will become familiar with some basic computer methods for vegetation ordination, classification and analysis. In these seminars, the students will use the data generated by them in the field and also data provide by the teachers. Seminars are oriented to the completion of the case study.

Personalized attention	
Methodologies	**Description**
Guest lecture / keynote speech Seminar Case study Laboratory practice Field trip	Guidance will be available to the students in order to solve possible doubts or problems that might arise during the course. Ideally, the student should make appointments with the lecturers by e-mail.

Assessment			
Methodologies	**Competencies**	**Description**	**Qualification**
Guest lecture / keynote speech	A1 A19 A22 A24 A27 A29 B1 B3 B4 B7 C3	The students will take a written exam to demonstrate that they have acquired the contents of the course.	50
Case study	A1 A2 A4 A6 A11 A19 A20 A22 A24 A27 A29 A30 A31 A32 B1 B2 B3 B4 B5 B6 B7 B8 B9 B12 C1 C3 C4	Different aspects will be considered in the assessment of the case study report: its structure, the quality of the data generated and of the data analysis and discussion. Presentation will also be assessed by the teachers.	40
Laboratory practice	A2 A4 A11 A29 A30 A31 B1 B4 B5 B7 C3	Attendance and participation will be valued.	5
Field trip	A32 B1 B2 B3 B5 B6 B7	Attendance and participation will be valued.	5

Assessment comments

In order to pass the course in the first opportunity, the student will have to participate in at least 70% of the programmed activities. In addition to this, the student will have to obtain a score of 4/10 in the final exam. In the second opportunity (july), the student will take a new written exam (60% of the final grade) and they will also take a practical exam involving plant and community identification and work with community inventories (40% of the final grade). In the cases where the student has succesfully completed the report in the first opportunity, this practical exam can be waived (depending on the quality of the report). Qualifications obtained in one course will not be kept for the following one. In order to be qualified as "non presentado" the student must not have participated in activities that are worth more than 30% of the final grade of the course. Part-time students or students who participate in equality and diversity support programs are welcome to participate in this subject. The teachers will adapt the different compulsory activities in order to enable these students to fulfill the aims of the course. Where appropriate, in the evaluation of students with part-time dedication or with the exception of attendance, 10% of the evaluation reserved for the evaluation of field trips and / or laboratory practices will be incorporated into the evaluation of the written objective test. If fraud is commited in any of the tests or activities of the continuous assessment, the student will be graded with FAIL "0" in the subject in the corresponding call.

Sources of information	
Basic	BIBLIOGRAFÍA BÁSICA E COMPLEMENTARIABellot,Francisco (Ed.) (1978) El tapiz vegetal de la Península Ibérica. 4ª ed. Blume, Madrid. 423 pp.Braune, W. & M.D. Guiry (2011) Seaweeds: A colour guide to common benthic green, brown and red algae of the world?s oceans. Gantner Verlag.Braun-Blanquet,J (1979) Fitosociología. 4ª ed. Blume, Madrid. 544 pp.Cabioc'h, J., J. Floc'h, A. Toquin, C.F. Le, Ch.-F. Bouduresque, A. Meinesz & M. Verlaque (2006) Guía de las algas del Atlántico y del Mediterráneo. Omega, Madrid.Cox, C.B. & Moore, P.D. (2010) Biogeography: an ecological and evolutionary approach. 8th ed. Hoboken, NJ. Wiley.Crawley,Michael J (1986) Varios artículos In: Plant Ecology. (Ed: Crawley,Michael J) Blackwell Scientific Publications, Oxford, 1-50; 253-291.Dawes, C.J. (1997) Marine Botany. John Wiley & Sons, Inc., New York.Ehrendorfer, F. (1986). Geobotánica. In: Strasburger, Tratado de Botánica. 7ª ed. española. Marín, Barcelona, 757-914.Feldmann, J. (1989) Las Algas, 97-324. In: Abbayes, H. des, M. Chadefaud, J. Feldmann, Y. de Ferré, H. Gaussen, P.-P. Grassé & A.R. Prévot. Botánica vegetales inferiores. Ed. Reverté, Barcelona.Good, R. (1974) The geography of the flowering plants. 4ª ed. Longman, London. 557 pp.Green, E.P. & F.T. Short (2003) World Atlas of Seagrasses. UNEP World Conservation Monitoring Centre. University of California Press, Berkely. 298 pp.Hartog, C. den (1970) The Sea grasses of the world. North Holland Publishing Company, Amsterdam, 272 pp.Huetz de Lemps, A. (1983) La vegetación de la tierra. Akal, Madrid. 263 pp.Ozenda, P. (1994) Végétation du Continent Européen. Delachaux et Niestlé, Lausanne & Paris. 271 pp.Peinado Lorca, M.; Rivas-Martínez, S. (Eds.) (1987) La vegetación de España. 4ª ed. Colección Aula Abierta - Univ. Alcalá de Henares, Madrid. 544 pp.Polunin, O.; Walters, M. (1989) Guía de la vegetación de Europa. 1ª ed. en Español. Ediciones Omega S.A., Barcelona. 236 + 170pl pp.Smith, R.L. (1990): Ecology and Field Biology. 4ª ed. Harper Collins Publishers, New York.
Complementary	

Recommendations
Subjects that it is recommended to have taken before
Introduction to Botany: General Botany/610G02023 Plant Systematics: Cryptogamia/610G02024 Plant Systematics: Phanerogamia/610G02025 Ecology I: Individuals and Ecosystems/610G02039 Ecology II: Populations and Communities/610G02040
Subjects that are recommended to be taken simultaneously
Subjects that continue the syllabus

Other comments
The number of locations where field trips will take place will depend on the number of students and the availability of means of transport to carry them out.

(*)The teaching guide is the document in which the URV publishes the information about all its courses. It is a public document and cannot be modified. Only in exceptional cases can it be revised by the competent agent or duly revised so that it is in line with current legislation.