



Teaching Guide

Teaching Guide				
Identifying Data				2023/24
Subject (*)	Plant Systematics: Cryptogamia		Code	610G02024
Study programme	Grao en Bioloxía			
Descriptors				
Cycle	Period	Year	Type	Credits
Graduate	1st four-month period	Second	Obligatory	6
Language	SpanishGalicianEnglish			
Teaching method	Face-to-face			
Prerequisites				
Department	Bioloxía			
Coordinador	Peña Freire, Viviana		E-mail	v.pena@udc.es
Lecturers	Peña Freire, Viviana Pimentel Pereira, Manuel		E-mail	v.pena@udc.es m.pimentel@udc.es
Web				
General description	Systematic Botany: Cryptogams. We will study fungi, algae, bryophytes and ferns in an evolutionary context, paying special attention to their phylogenetic positions. This course integrates information from previous courses (Biochemistry, Plant Physiology, Plant Anatomy and Histology, etc) and it will useful for students seeking to develop a career in research, teaching, environmental assessment, agriculture, ethnobotany, etc. Contents of this subject are reflected in the Sustainable Development Goals H2030, United Nations (Goal 14-Submarine life and Goal 15-Life in terrestrial ecosystems)			

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 espécimes.
A9	Identificar e utilizar bioindicadores.
A20	Muestrear, caracterizar e manexar poboacións e comunidades.
A22	Describir, analizar, avaliar e planificar o medio físico.
A26	Deseñar experimentos, obter información e interpretar os resultados.
A27	Dirixir, redactar e executar proxectos en Bioloxía.
A30	Manexar adecuadamente instrumentación científica.
A31	Desenvolverse con seguridade nun laboratorio.
A32	Desenvolverse con seguridade no traballo de campo.
B1	Aprender a aprender.
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.
B10	Exercer a crítica científica.
B11	Debater en público.

Learning outcomes

Learning outcomes	Study programme competences
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Acquire basic field- and laboratory work skills for the study of Cryptogams.	A4 A9 A20 A22	B1 B5 B7 B8	
Development of Cryptogams observation, description and identification skills, as well as assessment of Cryptogam species integration and presence in the natural environment.	A2 A4 A20 A22 A26 A27 A30 A31 A32	B1 B4 B6 B11	
Analyse Cryptogamic diversity: complexity, morphology, reproductive systems and adaptation to the environment.	A1 A2	B1 B3 B8 B9	
Understand the variation across the life cycles of the different groups of Cryptogams.	A1	B1 B3 B8 B9	
Encourage the student's interest in Cryptogamic variation and biology as key elements for a thorough understanding of biodiversity.		B3 B4 B6 B7 B8 B9 B10	
Understand the taxonomy of Cryptogams as a reflection of evolutionary relationships among the different groups.	A1 A2	B1 B3 B8 B9	
Acquire skills for a correct and critical use of the bibliography.	A27	B6 B8 B9 B10	

Contents	
Topic	Sub-topic
Lectures. Part I: Fungi. Systematics and Evolution	Lesson 1.- General features of fungi and fungi-like organisms. Fungal nutrition and life history. Ecological and economical importance. Origin and classification. Lesson 2.- General features of Acrasiomycota, Myxomycota and Plasmodiophoromycota. Reproduction and life history. Lesson 3.- General features of Oomycota. Reproduction and life history. Lesson 4.- Fungi sensu stricto. General features of Chytridiomycota, Zygomycota, Ascomycota and Basidiomycota. Reproduction and life history. Lesson 5.- Lichens, Fungi imperfectae (Deuteromycetes) and related groups. Ecological and economical importance. Summary and phylogeny of Fungi sensu lato.



Lectures. Part II: Algae. Systematics and Evolution	Lesson 6.- General features of algae. Algal biology, reproduction and life history. Ecological and economical importance. Origin and classification. Lesson 7.- Procariotic algae. Cyanophyta: characters, habitat and classification. Lesson 8.- Eucariotic algae. Rhodophyta: characters, reproduction, life history, habitat and classification. Lesson 9.- Eucariotic algae. Ochrophyta: characters, reproduction, life history, habitat and classification (Chrysophyceae, Xanthophyceae, Bacillariophyceae and Phaeophyceae). Lesson 10.- Eucariotic algae. Haptophyta, Cryptophyta, Dinophyta and Euglenophyta: characters, reproduction, life history, habitat and classification. Lesson 11.- Eucariotic algae. Chlorophyta and Streptophyta: characters, reproduction, life history, habitat, classification and examples of Prasinophyceae, Chlorophyceae and Ulvophyceae (Chlorophyta) and Charophyceae, Zygnematoephyceae and Coleochaetophyceae (Streptophyta). The origin of embryophytes.
Lectures. Part III: The colonization of drylands. Systematics and Evolution of embryophytes	Lesson 12.- Introduction to embryophytes. The origin of land plants. Adaptation to drylands. Lesson 13. Non vascular embryophytes; bryophytes s. lat.: characters, reproduction, life history, habitat and classification. Differential features of Anthocerophyta, Marchantiophyta and Bryophyta). Lesson 14.- Introduction to vascular plants. Telomatic theory. Lesson 15.- Euphyllphytina p.p. (Monilophytes, former Pteridophyta) and Lycophtina: features, reproduction, life history, habitat and examples of Lycopsidea, Psilophytosida, Psilotosida, Equisetopsida, Marattiopsida and Polypodiopsida. Phylogeny of ferns sensu lato.
THEORETICAL TEACHING (SEMINARS)	Seminar 1.- Fungi sensu lato: questions about reproduction, life history, definitions, etc. (2 hours). Seminar 2.- Algae: questions about reproduction, life history, definitions, etc. (2 hours). Seminar 3.- Embriophytic plants: questions about reproduction, life history, definitions, etc. (2 hours). Seminar 4.- General summary of the course and open questions for the students. (2 hours).
PRACTICAL TEACHING (FIELD TRIPS)	Field trip 1. Observation of cryptogams in terrestrial environments Field trip 2. Observation of cryptogams in marine environments
PRACTICAL TEACHING (LAB SESSIONS)	Lab session 1.- Observation, description, identification and preservation of Fungi sensu lato. Lab session 2.- Observation, description, identification and preservation of Lichens. Lab session 3.- Observation, description, identification and preservation of Red Algae. Lab session 4.- Observation, description, identification and preservation of Diatoms and Dinoflagellates Lab session 5.- Observation, description, identification and preservation of Brown Algae. Lab session 6.- Observation, description, identification and preservation of Green algae and Bryophytes s. l. Lab session 7.- Observation, description, identification and preservation of Ferns.



PRACTICAL TEACHING (PRACTICAL CASES)	Practical case 1.- Write a descriptive report of a natural environment of the seashore (mainly seaweeds and lichens), as well as a representative herbarium of the plants collected in the area. Practical case 2.- Write a descriptive report of a natural environment of a forest (mainly lichens, fungi, bryophytes s. lat. and ferns), as well as a representative herbarium of the plants collected in the area. This task is organised as alternative to the learning-service described below.
Learning-service	The students will acquire some of the skills programmed in the course through collaborative research work with NGOs. This activity is organised as alternative to the Case studies described above

Planning				
Methodologies / tests	Competencies	Ordinary class hours	Student's personal work hours	Total hours
Guest lecture / keynote speech	A1 A2 B1 B3 B8 B9	23	46	69
Seminar	A1 B1 B3 B7 B8 B9 B11	8	10	18
Laboratory practice	A9 A30 A31 B1 B5 B7 B8 B10	14	0	14
Case study	A2 A4 A20 A22 A27 A32 B1 B4 B6	0	16	16
Supervised projects	A22 A26 A27 B3 B8	0	16	16
Field trip	A2 A20 A22 A27 A32	12	3	15
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
Guest lecture / keynote speech	The lecturer will introduce all the basic concepts and ideas to the students using presentations, documents, videos, etc that will be provided in platforms offered by University of A Coruña.
Seminar	During the seminars, the student will autonomously analyse some of the contents of the course, using what they learnt during the lectures, as well as using the bibliography suggested by the lecturer. The work of the different students will be assessed and discussed by the group.
Laboratory practice	The student will conduct macro- and microscopic descriptions of the Cryptogams available to him in the lab. They will have to complete a questionnaire that will be assessed by the lecturer. The students will also improve their identifications skills through the use of taxonomic keys, guides and floras.
Case study	The student will write a report (in pdf) on the Cryptogam flora growing in two areas of their interest, one in or near the sea-shore (focused in marine algae) and another in a forest (focused in mosses, fungi and ferns). The student will have to collect specimens belonging to the different groups studied in the course, and they will have to prepare a Herbarium that will be assessed (together with the report) by the lecturer. The students will choose between the learning-service (supervised projects) program or these more traditional case studies. The number of hours of personal work is identical in both activities (31 hours)
Supervised projects	This activity has been designed within a learning-service framework. Here we combine students' academic activities with collaboration with environmentalist NGOs involved in plant conservation in Galicia. The students will choose between this learning-service program or the more traditional Case studies explained above. The number of hours of personal work is identical in both activities (31 hours).



Field trip	There will be two field trips (6 hours each) guided by the teaching staff with the aim of familiarising the students with the natural environments in which examples of cryptogams from different groups will be shown. During the field trip the teachers will give practical teaching based on the specimens found. Attendance to the field trips is voluntary, as well as the delivery of a report (in pdf) of the activities carried out for evaluation.
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Personalized attention	
Methodologies	Description
Seminar	Guidance will be available to the students in order to solve possible doubts or problems that might arise during the course.
Laboratory practice	Ideally, the student should make appointments with the lecturers by e-mail.
Case study	In case of students with academic exemption, different mechanisms of personalised attention -face-to-face or no face-to-face-
Field trip	will be applied to attend personally any doubts or questions that may arise
Supervised projects	

Assessment			
Methodologies	Competencies	Description	Qualification
Seminar	A1 B1 B3 B7 B8 B9 B11	The work done by the student in each of the seminars will be assessed, as well as their attitude and participation in them. The seminars will be graded, together with the lectures, in the objective written test.	0
Guest lecture / keynote speech	A1 A2 B1 B3 B8 B9	Assessment will be conducted through a written exam that will include essay questions, short-answer questions and a multiple choice questionnaire.	45
Laboratory practice	A9 A30 A31 B1 B5 B7 B8 B10	Qualifications will be based on a questionnaire that the student will have to complete during each lab session. Participation will also be considered.	25
Case study	A2 A4 A20 A22 A27 A32 B1 B4 B6	This activity and the supervised projects (aka learning service; explained below) are mutually exclusive. The corresponding assessment will be the sum of those attributed to each activity (case study and supervised projects) in this teaching guide, 30% of the overall grade. Qualifications will be based on the content and quality of the report written by the student. An oral exam will also be conducted in order to assess the quality of the herbarium that must be presented together with the report.	15
Field trip	A2 A20 A22 A27 A32	Attendance and participation will be considered as well as the quality of the report written by the student.	0
Supervised projects	A22 A26 A27 B3 B8	This activity and the case study (explained above) are mutually exclusive. The corresponding assessment will be the sum of those attributed to each activity (case studies and supervised projects) in this teaching guide, 30% of the overall grade. Reports will be graded based on quality and usefulness. The staff of the NGOs involved in the activity will be heard regarding the correction of the report.	15

Assessment comments



Students must pay special attention to the planning section of this teaching guide. It is essential that students understand that to be successful in the course they should work around 150 hours, from which 51 hours are onsite, either face to face or telematic. Non presential activities include (but are not limited to) preparation of case studies and reports, preparation of seminars and studying for the final exam.

Students who attend the voluntary field trips may also voluntarily submit a report (in pdf format) of the activities carried out for assessment.

In this way, the maximum percentage of this activity with respect to the final grade of the subject will increase from 1% for attendance and participation in the field trips to a maximum of 10%.

Attendance to the seminars is not compulsory, but the work carried out by the student in each of the seminars, as well as his/her attitude and participation in them, will be assessed with up to 1% of the final grade.

All students will have two opportunities to pass the course. In order to pass the course in the first opportunity it will be necessary to have a participation of at least 70% of the programmed evaluable activities.

Likewise, the student must obtain at least 4.5 out of 10 points in the objective written test (and no less than 4 in the different parts of this test) and 4 out of 10 in the rest of the compulsory evaluations. The final (overall) grade of the course must be above 5 points (out of 10). In order to obtain the grade of "not presented", the student must not have participated in 30% or more of the programmed evaluable activities.

To pass the course at the second opportunity (July), the student, depending on the result of his/her first evaluation, must take an objective written test similar to the first opportunity and/or a laboratory test in which he/she must complete a similar questionnaire used in the practicum. The need to take one or both of these make-up tests will be indicated in the grades of the first opportunity. The obtained qualifications will be kept only during the academic term (first and second opportunities). Students who fail on both occasions will have to repeat all the activities and evaluations of the subject the following year. On a case by case basis, those students that, for justified reasons, are not able to participate in all the programmed activities will be given alternative options to pass the course.

Students with officially recognised academic exemption or 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.

The fraudulent performance of the assessment tests or activities, once verified, will directly imply the grade of failure (numerical mark "0") in the subject in the corresponding call of the academic year, whether the fault is committed at the first opportunity or at the second opportunity. For this, the grade will be modified in the first opportunity report, if necessary.

This course has the following key dates:

Lab course: between September and November, 2023 (specific dates are still pending to be confirmed, they will be communicated in advance)

Field trips (voluntary): September 26 and September 30, 2023

Submission (voluntary) of the field trips report - in pdf format -

(deadline): Friday 14 October 2023.

Open Lab sessions: between October and November, 2023 (specific dates are still pending to be confirmed, they will be communicated in advance)

Case study (pdf) report submission and herbarium exam: December 18, 2023

Supervised projects (pdf) report submission: December 18, 2023.

EARLY

CALL FOR DECEMBER

The

teaching guidethat will be applied to students who apply for the early December call will bethat of the previous academic year.



Sources of information

Basic	A principio de curso os profesores porán a disposición do estudantado unha lista de referencias máis completa, especialmente referida a grupos concretos dentro da materia BIBLIOGRAFÍA BÁSICA PARA TEORÍA: ABBAYES, H. des, M. CHADEFAUD, J. FELDMANN, Y. de FERRÉ, H. GAUSSEN, P.-P. GRASSÉ & A.R. PRÉVOT (1989) Botánica, vegetales inferiores. Reverté, Barcelona. BOLD, H.C., C. J. ALEXOPOULOS & T. DELEVORYAS (1989) Morfología de plantas y hongos. Omega, Barcelona. CARRIÓN, J.S. (2003) Evolución vegetal Editorial: DIEGO MARIN, ed. 497 Págs. DÍAZ GONZÁLEZ, T.E. M^a C. FERNÁNDEZ-CARVAJAL ÁLVAREZ & J.A: FERNÁNDEZ PRIETO (2004) Curso de Botánica. Trea Ciencias. FONT-QUER, P. (1993) Diccionario de Botánica. Labor, Barcelona. GORENFLOT, R. (1975) Précis de botanique, 1 Protocaryotes et Thallophytes eucaryotes. Doin, Paris. GORENFLOT, R. & M. GUERN (1989) Organisation et biologie des thallophytes. Doin, 235 plzco, J., E. BARRENO, M. BRUGUÉS, M. COSTA, J. DEVESA, F. FERNÁNDEZ, T. GALLARDO, X. LLIMONA, E. SALVO, S. TALAVERA & B. VALDÉS (1997) Botánica. McGraw-Hill, Madrid. PEARSON, L.C. (1995) The diversity and evolution of plants. C.R.C. Press, New York. RAVEN et al. (1991) Biología de las plantas. RODRÍGUEZ IGLESIAS, F. (Ed.) Galicia Naturaleza. Botánica I. Hércules de Ediciones, S.A., A Coruña. SCAGEL, R.F., R.J. BANDONI, G.E. ROUSE, W.B. SCHOFIELD., J.R. STEIN & T.M.C. TAYLOR (1987) El Reino Vegetal. Omega, Barcelona. SCAGEL, R.F., R.J. BANDONI, J.R. MAZE, G.E. ROUSE, W.B. SCHOFIELD & J.R. STEIN (1991) Plantas no vasculares. Omega, Barcelona. STRASBURGER, E., F. NOLL, H. SCHENCK & A.F.W. SCHIMPER. (2004) Tratado de Botánica (actualizado por P. SITTE et al.) Omega, Barcelona. BIBLIOGRAFÍA BÁSICA PARA PRÁCTICAS: EGEA FERNANDEZ, J.M^a & P. TORRENTE PAÑOS (1997) Manual de Teoría y Prácticas de Botánica. DM Librero Editor. GUERRA MONTES, J., J.S. CARRIÓN, M. ABOAL, J.M. EGEA & R.M. ROS (1988) Guiones de clases prácticas de Botánica. Promociones y publicaciones Universitarias, Barcelona. MANOBENS, R. M^a (1988) Botánica, instruccions per als recol-lectors de plantes: l'herbari. Preparació i documentació. Generalitat de Catalunya.
Complementary	

Recommendations

Subjects that it is recommended to have taken before

Introduction to Botany: General Botany/610G02023

Subjects that are recommended to be taken simultaneously

Subjects that continue the syllabus

Plant Systematics: Phanerogamia/610G02025

Other comments



Although it is not indispensable, is very important that the student had passed the subject ?Introduction to Botany? (1st course of the degree) and to keep in mind the acquired knowledge in order to be applied in the present subject.

Gender perspective

According to the different regulations applicable to university teaching, the gender perspective must be incorporated into this subject (non-sexist language will be used, bibliography of authors of both sexes will be used, the intervention of male and female students in class will be encouraged...).

Work will be done to identify and modify sexist prejudices and attitudes and the environment will be influenced in order to modify and promote values of respect and equality.

Situations of gender discrimination will be detected and actions and measures will be proposed to correct them.

Green

Campus Program of the Faculty of Sciences

To help to achieve a sustainable environment and fulfil with the point 6 of the "Environmental Statement of the Faculty of Sciences (2020)", the documentary works conducted in this subject:

a) will be asked mostly in virtual format and computer support.

b) if paper is employed:

- do not use plastics.

- choose duplex/two-sided printing.

- use recycled paper.

- avoid the use of drafts



(*)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.