



Teaching Guide				
Identifying Data				2016/17
Subject (*)	Botánica sistemática: Criptogamia	Code	610G02024	
Study programme	Grao en Bioloxía			
Descriptors				
Cycle	Period	Year	Type	Credits
Graduate	1st four-month period	Second	Obligatoria	6
Language	SpanishGalician			
Teaching method	Face-to-face			
Prerequisites				
Department	Bioloxía Animal, Bioloxía Vexetal e Ecoloxía			
Coordinador	Pimentel Pereira, Manuel	E-mail	m.pimentel@udc.es	
Lecturers	Barbara Criado, Ignacio Manuel Díaz Tapia, Pilar Peña Freire, Viviana Pimentel Pereira, Manuel	E-mail	ignacio.barbara@udc.es p.diaz@udc.es 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 be useful for students seeking to develop a career in research, teaching, environmental assessment, agriculture, ethnobotany, etc.			

Study programme competences / results	
Code	Study programme competences / results
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.
A27	Dirixir, redactar e executar proxectos en Bioloxía.
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.
B6	Organizar e planificar o traballo.
B7	Comunicarse de maneira efectiva nunha contorna de traballo.
B8	Sintetizar a información.
B9	Formarse unha opinión propia.
B11	Debater en público.

Learning outcomes			
Learning outcomes			Study programme competences / results
-Aprender as técnicas básicas do traballo de campo e laboratorio en Criptogamia.			A4 A9 B1 B7 B8



-Desenvolver capacidades de observación, descrición e identificación de criptógamas e o seu grao de integración e presenza no medio natural.	A2 A4 A20 A22 A27 A32	B1 B4 B6 B11	
-Coñecer a diversidade vexetal das criptógamas: niveis morfolóxicos de organización, complexidade dos sistemas reprodutivos e a relación co medio no que viven.	A1 A2	B1 B3 B8 B9	
-Comprender os tipos reprodutivos e os distintos ciclos biolóxicos característicos dos distintos grupos vexetais.	A1	B1 B3 B8 B9	
-Incentivar un maior interese e motivación para a aprendizaxe da Criptogamia, como unha ciencia básica para unha formación completa en Bioloxía.		B3 B4 B6 B7 B8 B9	
-Comprender a organización taxonómica das criptógamas, que reflicte as relacións evolutivas entre os distintos grupos vexetais.	A1 A2	B1 B3 B8 B9	
-Desenvolver o hábito e a capacidade para o manexo axeitado e crítico da bibliografía.	A27	B6 B8 B9	

Contents	
Topic	Sub-topic
THEORETICAL TEACHING (FUNGI AND LICHENS)	<p>Lesson 1.- General features of fungi and fungi-like organisms. Fungal nutrition and life history. Ecological and economical importance. Origin and classification.</p> <p>Lesson 2.- General features of Acrasiomycota, Myxomycota and Plasmodiophoromycota. Reproduction and life history.</p> <p>Lesson 3.- General features of Oomycota. Reproduction and life history.</p> <p>Lesson 4.- Fungi sensu stricto. General features of Chytridiomycetes, Zygomycetes, Ascomycetes and Basidiomycetes. Reproduction and life history.</p> <p>Lesson 5.- Lichens, Fungi imperfectae (Deuteromycetes) and related groups. Ecological and economical importance. Summary and phylogeny of Fungi sensu lato.</p>



THEORETICAL TEACHING (ALGAE)	<p>Lesson 6.- General features of algae. Algal biology, reproduction and life history. Ecological and economical importance. Origin and classification.</p> <p>Lesson 7.- Procariotic algae. Cyanophyta: characters, habitat and classification.</p> <p>Lesson 8.- Eucariotic algae. Rhodophyta: characters, reproduction, life history, habitat and classification.</p> <p>Lesson 9.- Eucariotic algae. Ochrophyta: characters, reproduction, life history, habitat and classification (Chrysophyceae, Xanthophyceae, Bacillariophyceae and Phaeophyceae).</p> <p>Lesson 10.- Eucariotic algae. Haptophyta, Cryptophyta, Dinophyta and Euglenophyta: characters, reproduction, life history, habitat and classification.</p> <p>Lesson 11.- Eucariotic algae. Chlorophyta: characters, reproduction, life history, habitat and classification (Chlorophyceae, Prasinophyceae, Ulvophyceae and Charophyceae). Summary and phylogeny of Algae.</p>
THEORETICAL TEACHING (MOSESSES, LIVERWORTS, STONEWORTS AND FERNS)	<p>Lesson 12.- Introduction and origin of land plants. Bryophyta: characters, reproduction, life history, habitat and classification (Anthoceroopsida, Marchantiopsida and Bryopsida). Origin and phylogeny of embriophytic plants.</p> <p>Lesson 13.- Introduction to vascular plants. Telomatic theory.</p> <p>Lesson 14.- Pteridophyta: characters, reproduction, life history, habitat and classification (Psilophytopsida, Psilotopsida, Lycopodiopsida, Equisetopsida and Pteridopsida). Origin and phylogeny of ferns sensu lato.</p>
THEORETICAL TEACHING (SEMINARS)	<p>Seminar 1.- Fungi sensu lato: questions about reproduction, life history, definitions, etc. (2 hours).</p> <p>Seminar 2.- Algae: questions about reproduction, life history, definitions, etc. (2 hours).</p> <p>Seminar 3.- Embriophytic plants: questions about reproduction, life history, definitions, etc. (2 hours).</p> <p>Seminar 4.- General summary of the course and open questions for the students. (2 hour).</p>
PRACTICAL TEACHING (FIELD TRIP)	<p>Fiel trip (morning and afternoon) along the seashore and wet continental habitats for studying plants in their habitat and collection samples for the lab.</p>
PRACTICAL TEACHING (LAB SESSIONS)	<p>Lab session 1.- Observation, description, identification and preservation of Fungi sensu lato.</p> <p>Lab session 2.- Observation, description, identification and preservation of Lichens.</p> <p>Lab session 3.- Observation, description, identification and preservation of Brown seaweeds.</p> <p>Lab session 4.- Observation, description, identification and preservation of Green algae.</p> <p>Lab session 5.- Observation, description, identification and preservation of Red seaweeds.</p> <p>Lab session 6.- Observation, description, identification and preservation of Mosses and Liverworts.</p> <p>Lab session 7.- Observation, description, identification and preservation of Ferns sensu lato.</p>
PRACTICAL TEACHING (PRACTICAL CASES)	<p>Practical case 1.- Devise a descriptive report of a natural environment of the seashore (mainly seaweeds and lichens), as well as a representative herbarium of the plant collected in the area.</p> <p>Practical case 2.- Devise a descriptive report of a natural environment of a wet forest (mainly lichens, mushrooms, mosses, liverworts and ferns), as well as a representative herbarium of the plant collected in the area.</p>



Planning				
Methodologies / tests	Competencies / Results	Teaching hours (in-person & virtual)	Student?s personal work hours	Total hours
Guest lecture / keynote speech	A2 A1 B1 B3 B8 B9	21	42	63
Seminar	A1 B1 B3 B7 B8 B9 B11	7	21	28
Laboratory practice	A9 B1 B7 B8	14	7	21
Case study	A2 A4 A20 A22 A27 A32 B1 B4 B6	0	23	23
Field trip	A2 A20 A22 A27 A32	6	6	12
Personalized attention		3	0	3

(*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	O profesor impartirá os conceptos básicos para a comprensión da materia axudándose de presentacións e documentos que porá previamente á disposición dos estudantes.
Seminar	O estudante deberá preparar de xeito autónomo algúns dos conceptos ou contidos da materia, empregando os contidos básicos das sesións maxistras e consultando a bibliografía que recomendará o profesor. Os seminarios serán postos en común durante as distintas sesións nas que o traballo dos estudantes someterase a discusión e avaliación.
Laboratory practice	O estudante terá que realizar descrições macroscópicas e microscópicas de criptógamas e completar un guión dispoñible con anterioridade á práctica e que será avaliado. Tamén se realizarán exercicios de identificación mediante o uso de claves, floras e monografías.
Case study	O estudante deberá realizar mostraxes en ambientes mariños e de bosque para a recolección de criptógamas representativas de ambos ambientes. Posteriormente, procesará os materiais recollidos, identificándoos e conservándoos en pregos de herbario que entregará para a súa avaliación.
Field trip	Realizarase unha saída ó campo guiada polos profesores co obxecto de que os estudantes se familiaricen cos ambientes naturais nos que se amosarán exemplos de criptógamas. Na saída o profesor impartirá docencia práctica en base ós exemplos que se atopen ese día.

Personalized attention	
Methodologies	Description
Seminar Laboratory practice Case study Field trip	Atenderase ó estudante de xeito personalizado para todas aquelas dúbidas ou cuestións que lle xurdan nas distintas actividades realizadas.

Assessment			
Methodologies	Competencies / Results	Description	Qualification
Seminar	A1 B1 B3 B7 B8 B9 B11	Qualifications will be based on the work conducted by the student as well as on his/her participation in class. Attendance to the seminars is compulsory. Competencies: A1, B1, B3, B7, B8, B9, B11	1
Guest lecture / keynote speech	A2 A1 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. A1, A2, B1, B3, B8 and B9	49
Laboratory practice	A9 B1 B7 B8	Qualifications will be based on a questionnaire that the student will have to complete during each lab session. Participation will also be considered. Competencies: A9, B1, B7, B8	20



Case study	A2 A4 A20 A22 A27 A32 B1 B4 B6	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. Competencies: A2, A4, A20, A22, A27, A32, B1, B4, B6	20
Field trip	A2 A20 A22 A27 A32	Qualifications will be based on the report written by the student. Attendance and participation will also be considered. Competencies: A2, A20, A22, A27, A32.	10

Assessment comments

Students must pay special attention to the planning section. It is essential that they understand that to be successful in the course they should work around 150 hours (50 presential). Non presential activities include (but are not limited to) studying for the final exam and preparation of reports. All students that participate in more than 30% of the activities of the course will obtain a qualification. To pass the course in the first opportunity, students must participate at least in 70% of the activities of the course. All students must obtain at least 4,5 points out of 10 in the written exam and 4 out of 10 points in the rest of the activities. To pass the course in the second opportunity (July) all students (depending on the grades obtained in the first opportunity) must take a written exam and/or a lab test. The obtained qualifications will be kept only during the academic term (January-July). 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.

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.

Sources of information

Basic	<p>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 p IZCO, 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: EGEE 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. EGEE & 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.</p>
Complementary	

Recommendations

Subjects that it is recommended to have taken before

Iniciación á Botánica: Botánica xeral/610G02023

Subjects that are recommended to be taken simultaneously

Subjects that continue the syllabus



Botánica sistemática: Fanerogamia/610G02025

Other comments

Se ben non é imprescindible, é moi importante que o alumno teña aprobada a materia de Iniciación á Botánica do primeiro curso do Grao.

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