Universitat Autònoma de Barcelona

2021/2022

Plant Physiology and Botanics

Code: 102811
ECTS Credits: 9

Degree	Type	Year	Semester
2501915 Environmental Sciences	FB	1	2

The proposed teaching and assessment methodology that appear in the guide may be subject to changes as a result of the restrictions to face-to-face class attendance imposed by the health authorities.

Contact

Name: Jordina Belmonte Soler
Email: Jordina.Belmonte@uab.cat

Use of Languages

Principal working language: catalan (cat)
Some groups entirely in English: No
Some groups entirely in Catalan: Yes
Some groups entirely in Spanish: No

Teachers

Jordina Belmonte Soler
Benet Gunsé Forcadell

Prerequisites

Although there are no official prerequisites, it is advisable for the student to have prior knowledge of Biology.

Objectives and Contextualisation

Objectives

Knowing the living organisms and understanding their functioning is necessary to maintain the biodiversity and the environment in the most favorable conditions for life.

This course is an indispensable preparatory basis for later subjects such as: Ecology, Environmental plant physiology, Analysis of vegetation and Applied ecology.

The course consists of two parts: Botany (BOT) and Plant physiology (FV).

The objectives in the part of Botany are to introduce the student to the knowledge of the large groups of organisms that comprise the vegetal world, the respective differential traits and the fundamental aspects of their biology and distribution. The ultimate aim is for the student to assess the biological function of organisms and the landscape, which is essential for good valuation, management and legislation.

The objectives of the part of plant physiology consist in introducing to the student in the knowledge of the functions and mechanisms that regulate the life of the vegetables.

Competences

- Adequately convey information verbally, written and graphic, including the use of new communication and information technologies.
- Analyze and use information critically.
- Collect, analyze and represent data and observations, both qualitative and quantitative, using secure adequate classroom, field and laboratory techniques
- Demonstrate adequate knowledge and use the most relevant environmental tools and concepts of biology, geology, chemistry, physics and chemical engineering.
- Demonstrate concern for quality and praxis.
- Demonstrate initiative and adapt to new situations and problems.
- Learn and apply in practice the knowledge acquired and to solve problems.
- Quickly apply the knowledge and skills in the various fields involved in environmental issues, providing innovative proposals.
- Teaming developing personal values regarding social skills and teamwork.
- Work autonomously

Learning Outcomes

1. Adequately convey information verbally, written and graphic, including the use of new communication and information technologies.
2. Analyze and use information critically.
3. Define the basis for the regulation of vital functions of organisms through internal and external and identify mechanisms of adaptation to the environment factors.
4. Demonstrate concern for quality and praxis.
5. Demonstrate initiative and adapt to new situations and problems.
6. Describe the life cycles of organisms.
7. Evaluate the responses of organisms to environmental changes.
8. Identify organisms and biological processes in the surrounding environment and evaluate them properly and originally.
9. Identify organisms and recognize the different levels of biological organization.
10. Learn and apply in practice the knowledge acquired and to solve problems.
11. Observe, recognize, analyze, measure and properly and safely represent organisms and biological processes.
12. Teaming developing personal values regarding social skills and teamwork.
13. To assess the effects of the organisms on the environment.
14. Work autonomously

Content

Contents

Plant Physiology (3 credits)

- Plants and the environment.
- Needs and use of resources for plants:

    Light

    Water

    Mineral Nutrients

    Carbon.

- Photosynthesis and respiration.
- Growth, development, senescence and death of plants.
- Agriculture and transgenic.

Botany (6 credits)

- Unit 1: Introduction to Botany.
- Unit 2: Systematics and taxonomy.
- Unit 3: Nuclear and somatic organization levels. Prokaryotes and eukaryotes. Prophytes, Thallophytes and Cormophytes.
- Unit 4: Reproduction. Biological cycles.
- Unit 5: Fungi S.L.
- Unit 6: Photosynthetic prokaryotic aqueatic organisms: Cyanobacteria.
- Unit 7: Photosynthetic aquatic eukaryotic organisms.
- Unit 8: Bryophytes.
- Unit 9: Vascular cryptogams.
- Unit 10: Flowering plants.
- Unit 11: Geobotanics.
- Unit 12: Vegetation of the Iberian Peninsula and Catalonia.

Methodology

Methodology

The teaching methodology combines master classes, practical classes, personal study and individual and team work.

Theory:

Theory managers: Benet Gunsé (FV) and Jordina Belmonte (BOT).

1 Group of students.

Lessons will be taught in the classroom using computer and projection cannon.

Students will be provided with material through the Interactive Campus (Campus Virtual), so that in the classroom they can have a paper version or information in the personal computer of multiple images and schemes that complement the teacher's explanations, the diagrams on the board and the subsequent bibliographical researches. Also, through the Virtual Campus, students will be suggested reading and consulting websites that will be part of individual and teamwork and study.

Plant Physiology: 13 sessions of theory.

Botany: 26 sessions of theory.

Seminars:

Seminars: Benet Gunsé (FV) and Moisés Guardiola (BOT); Other professors, researchers or related professionals can collaborate.

In the case of FV there will be 2 groups of students, at the time of participating in the seminars.

Topics related to the subject and its professional aspect will be exhibited. Students will be promoted to participate through debates, presentations and memoirs to write.

Plant Physiology: 4 sessions of seminars/group (2 groups); 1 hour/session.

Botany: 3 sessions of seminars/group; 2 hours/session.

Practices:

Laboratory of practices responsibles: Benet Gunsé (FV) and Jordina Belmonte (BOT). Other teachers can collaborate in teaching the subject.

Integrated Laboratory of Environmental Sciences(C5-Senar, 2nd floor).

It will not be allowed to enter in the laboratories after 15 minutes from the beginning of practical class.

Responsible of the field trips BOT: Jordina Belmonte. Other teachers will collaborate in teaching the subject.

5 groups of students, when participating in practices in the laboratory.

Through the Campus Virtual, the student will be informed of the tasks to be carried out in each practical session, the necessary knowledge and the material that is to be taken to attend the laboratory or the field. In the laboratory the student will find the necessary material to develop the practice.

Plant Physiology:

Laboratory practices: 3 days/group; 3 Hour/day

Botany:

Laboratory practices: 5 days/group; 3 Hours/day

Fieldwork: 2 days/group; 3 hours/day (UAB Campus) and 6 hours/day (Montseny or similar)

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Field practices.	10	0.4	2, 10, 13, 7, 3, 5, 4, 6, 9, 1, 14, 12
Laboratory practices	24	0.96	2, 10, 13, 7, 3, 5, 4, 6, 8, 9, 11, 14, 12
Seminars	39	1.56	2, 13, 7, 3, 5, 4, 6, 8, 9, 11, 14
Theory lectures	6	0.24	2, 10, 13, 7, 3, 5, 4, 8, 9, 11, 1, 14, 12
Type: Supervised			
tutoring	5.6	0.22	2, 10, 13, 7, 3, 5, 4, 6, 8, 9, 11, 14, 12
Type: Autonomous			
Preparation of dossiers and reports	18	0.72	2, 10, 13, 7, 3, 5, 4, 6, 8, 9, 11, 14
Reading documents and bibliographic work	39	1.56	2, 10, 13, 7, 3, 5, 4, 6, 8, 9, 11, 14
Study, scheme buiding and solving of problems	78	3.12	2, 10, 13, 7, 3, 5, 4, 6, 8, 9, 11, 14, 12

Assessment

The competences of the course will be evaluated by several tests, each of which with a specific weight on the final grade. See details below.

GLOBAL NOTE: It will take into account the notes obtained in the Plant Physiology (FV) and botany (BOT) tests and, following the distribution of credits, we will calculate: Global Note = 0.33 * FV + 0.67 * BOT.

- Weight of the different FV notes in the Global Note: FV = 70% theory + 20% practice + 10% Seminars.
- Weight of the different notes of BOT in the Global Note: BOT = 55% Theory and seminars + 45% practices.

MARKS of the different TESTS:

Theoretical part, FV and BOT assessment:

- Theory exams: Written and/or oral exams will be done on the theory imparted in classes.

Evaluation Part Practices:

- FV: The students will perform an exam to be determined by the grade. They will also produce a non-evaluable internship report, which can be used to modulate the internship grade. Caution: Attendance at practical PV classes is obligatory (except justified cause). Students who do not attend will not be evaluated and therefore cannot pass the subject.
- BOT: A) Practice reports: The internship reports will be evaluated with a total weight of 20% on the BOT internship note. b) Test of practices: there will be a written examination of the teaching given and the studies suggested in the practical classes with an overall weight of 80% of the practice mark of BOT. Attention: The assistance in the practical classes of BOT is not compulsory. Students who do not follow them only will be evaluated with the exam grade.

Evaluation of seminars and bibliographic work (FV):

- The preparation, presentation and exhibition of bibliographic work will be evaluated. The preparation will be evaluated from a summary delivered as will be detailed in the Campus Virtual

The student must achieve each of the tests: Theory, practices and seminars. If you do not do this in the partial tests, you will have the option of doing it in the compensation tests, doing those that are left to overcome, except for the FV seminars.
To PASS the COURSE it is necessary:

- To pass the course it is necessary to obtain a global score 5 or above 5.
- In the case of FV, they can intervene in the calculation of the overall grade of the course scores of 4.5, but never lower. In the case of BOT, you can compensate the note between the partials of theory if any of them is suspended with a grade equal or higher than 4.5. Also, a score equal or greater than 4.5 in the exam of the practical part will be valid for the calculation of the practice's grade.
- Students will have to repeat the tests with score between 4.5 and 4.9 (FV and BOT) when the overall grade for each module does not exceed the approved (5 or higher than 5).
- Non-evaluable: A student will receive the qualification of "No evaluable" if and only if he/she has not presented to any of the proofs of evaluation and has not delivered any of the evaluable documents required.
- Only those students who have previously presented 2/3 of the assessable activities can opt for recovery. Students who do not take the evaluation of any of the parts, both theoretical and practical, will be automatically suspended with a maximum score of 4 regardless of whether the weighted global grade can be higher than this value.
- The grades will have a single decimal. The final grade of the course will be rounded off to the closest integer when it is at onetenth of a value that <spanid="tgtAlignment_653" class="ts-alignment-element" data-is-focusable="true">entails a qualitative change in qualification.
- The obtention of Matrícula de Honor (MH) will apply to grades equal to or higher than 9.0. The number of MH will depend on the number of students enrolled on the current course.
- Special cases: The special cases, duly justified, will be solved individually with the professors of the subject.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Botany seminars	5%	0.4	0.02	2, 10, 5, 4, 1, 14, 12

Examination of plant Physiology theory	22%	1	0.04	13, 7, 3, 8, 11
Plant Physiology seminars	5%	0.4	0.02	2, 10, 5, 4, 1, 14, 12
Practical exam of Botany	12%	0.6	0.02	2, 10, 5, 4, 8, 9, 11, 1, 14
Examination of Botany theory	45%	2	0.08	2, 13, 7, 6, 8, 9, 1, 14
Global mark of Plant Physiology and Botany.	0%	0	0	2, 10, 13, 7, 3, 5, 4, 6, 8, 9, 11, 1, 14, 12
Practical exam of Plant Physiology	6%	0.5	0.02	2, 10, 13, 7, 3, 5, 4, 11, 1, 12
Practical exam of botany	5%	0.5	0.02	10, 5, 4, 6, 8, 9, 11, 1, 14

Bibliography

Plant Physiology

Basic literature in Plant Physiologyl,

- J. Barceló et al., Ed. Pirámide, Madrid 2005
- Plant Physiology, L. Taiz y E. Zeiger, 4th edition, Sinauer, Sunderland, MA (USA, 2006)
- Web link http://4e.plantphys.net/

BOTÁNICS

Basic literature

1) Bresinsky, A. et al. 2013. Strasburger's Plant Sciences (Including Prokaryotes and Fungi). Springer. Berlin

2) BOLÒS, O. de, VIGO, J., MASALLES, R.M. & NINOT, J.M. 2005. Flora Manual dels Països Catalans. Editorial Pòrtic. Barcelona.

3) DIVERSOS AUTORS. 1984-1988. Història Natural dels Països Catalans. Volums 4, 5, 6 i 7. Fundació Enciclopèdia Catalana. Barcelona.

4) DIVERSOS AUTORS. 1989-1999 Guies de diversos grups d'organismes vegetals editades per Editorial Pòrtic i per Editorial Omega. Barcelona.

5) IZCO, J. et al. 2004. Botánica. McGraw-Hill-Interamericana. Madrid.

6) LEE, R.E. 2008. Phycology. Fourth edition. Cambridge University Press, New York.

7) NUET, J. PANAREDA, J.A. & ROMO, A. 1992. Vegetació de Catalunya. Editorial Eumo. Vic.

8) RAVEN, P.H., EVERT, R.F. & EICHHORN, S.E. 1991-1992. Biología de las plantas. Vols. 1-2. Editorial Reverté. Barcelona.

9) SIMPSON, M. G. 2010. Plant Systematics. 2nd ed. Elsevier. Academic Press.

Web links

10) Tree of life, Web project: http://tolweb.org/tree/

11) Herbari Virtual de la Unitat de Botànica: https://blogs.uab.cat/herbari/

12) Flora Catalana: http://www.floracatalana.net/

13) Flora Ibérica: http://www.floraiberica.es/

Common

- Aula Virtual de la Autónoma Interactiva: https://cv2008.uab.cat

Software

No need of software.