

Mycology

Code: 101026
ECTS Credits: 6

Degree	Type	Year	Semester
2500502 Microbiology	OB	3	1

Contact

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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

Prerequisites

Although there are no official prerequisites, it is advisable to have studied basic concepts and biological processes in other subjects such as in

Plant Biology, Ecology, or Microbiology.

It would be also appropriate to have a good knowledge of the subjects that are being studied simultaneously along the first semester.

Objectives and Contextualisation

This is a 3rd year subject, where students should already have achieved an integrative vision, both in terms of a general knowledge of the diversity of organisms and of biological and ecological processes.

This previous knowledge will be complemented with this subject, where students will be introduced to the study of the fungal world from various perspectives, emphasizing the most basic concepts and competences that will allow the student to develop autonomously in this field.

General objectives of the subject:

1. Understand the phylogenetic position and the various organisms studied by mycologists.
2. To recognize the different structures and the composition of the vegetative and reproductive body fungus in relation to its functionality.
3. To know the nutritional strategies of the various groups of organisms studied by mycologists (amoeboid fungi, pseudofungi and true fungi) and their ecological value.
4. To broadly recognize the mycological diversity and to know how to distinguish the characteristics that define the main fungal groups.

5. Understand the biology (vital cycles, reproductive strategies, etc.) of the main groups.
6. To cope with the ecological, economic and social importance of the various fungal groups here studied.
7. Recognize the main interactions of the fungus-biocenosis / fungus-biotope

Competences

- Communicate orally and in writing.
- Display sensibility towards environmental, health and social matters.
- Know and interpret microbial diversity, the physiology and metabolism of microorganisms and the genetic bases that govern their vital functions.
- Obtain, select and manage information.
- Use bibliography or internet tools, specific to microbiology or other related disciplines, both in English and in the first language.

Learning Outcomes

1. Communicate orally and in writing.
2. Display sensibility towards environmental, health and social matters.
3. Identify the role of the different microbial groups in the environment and in the cycles of the elements, and their environmental implications
4. Know microbial growth and the physical and chemical processes used to control it.
5. Obtain, select and manage information.
6. Recognise the diversity of the microbial world and identify the different groups it is composed of.
7. Recognise the role of microorganisms as agents of disease or toxicological problems in human beings, animals and plants.
8. Use bibliography or internet tools, specific to microbiology or other related disciplines, both in English and in the first language.

Content

Subject content:

1. What are fungi? Basic attributes of "fungal" organisms. Fungi in all living things. Classical and modern systematics. Fungal biodiversity.

2. The fungal Thallus. Unicellular and Filamentous forms. Hypha and Mycelia. The fungal cell. The fungal cell wall. Hyphal growth. Fungal Mitosis SPBs.

The organelles. Hyphal modifications.

3. Nutritional strategies: Phagotrophy and Lisotrophy. Metabolism and Physiology. Ecological Factors. Culture media. Control.

4. Reproduction. Asexual and sexual reproduction. Genetics. Genetic compatibility. Heterokaryosis. Parasexuality. Pleomorphism. Biological cycles.

5. Systematics. Fungal diversity. Grouping criteria. Phylogeny. Molecular biology and its impact on current systematics. Fossil record.

6. The Amoeboid fungi (Amoebozoa). Generalities. Phyl. Myxomycota. Cl. Dictyosteliomycetes. Cl. Myxomycetes. Vital cycle Ecology Other related groups.

7. Pseudofungi (Phyl. Heterokonta. Stramenopiles) Concept of pseudofongi and systematics used. Generalities Cl. Hyphochytriomycetes. Cl. Labyrinthulomycetes.
- O. Saprolegniales. Cl. Peronosporomycetes. O. Peronosporales and O.Pitiales: the mildews and other disorders. Morphology, reproduction, ecology.
8. The true Fungi (Fungal kingdom). Systematic conflicts. Characteristics of the vegetative body and breeding structures. "Chytrids sensu lato". Biology, ecology and diversity .
- Phyl. Zygomycota. Biology, ecology and diversity. Phyl. Glomeromycota. Ecology and diversity.
9. Ascomycota. Main characteristics of the group. Yeasts: Biology, ecology, diversity and its applications. Saccharomycotina. Taphrinomycotina.
10. Pezizomycotina. Fruit-body-forming Ascomycota. Cl. Pezzizomycetes. Biology. ecology and diversity.
11. Laboulbeniomycetes and Sordariomycetes. Biology. ecology and diversity.
12. Eurotiomycetes. Biology. ecology and diversity.
13. Dothideomycetes. Biology. ecology and diversity.
14. Mitosporic fungi. Diversity, spore-formation, ecology, economic importance.
15. Basidiomycota. CL. Puccinioycetes. Cl. Ustilaginomycetes. Biology. ecology and diversity. Economic importance.
16. Basidiomycota. Agaricomycotina-1. Biology. ecology and diversity. Economic importance.
17. Basidiomycota. Agaricomycotina-2. Biology. ecology and diversity. Economic importance.
18. Fungal symbiosis: Lichens and Mycorrhiza

Methodology

The subject of MICOLOGY will be structured from the theoretical classes, from which a series of proposals for complementary training activities will be dealt with: This part of the content of the subject will be given in the form of:

PARTICIPATION in THEORETICAL CLASSES: -materials with the help of ICT tools, and complemented with the educational material prepared for this purpose and accessible to students in the Virtual Campus of the UAB. Class participation will be encouraged in the form of interventions and debates. The student will have to complement the personal study with the topics explained, and can resort to personalized tutorials in accordance with the requirements that the student and the professor consider necessary

PARTICIPATION IN THE FORUM of the CV: - One or more forums will be activated in order to encourage the participation of students using work tools that encourage interaction, debate and dynamic learning. In these forums, it will require periodic participation in the form of contributions, the subject of which will be determined by theoretical classes. The amount and quality of the contributions will be calculated as part of the student's continuous assessment assignments.

SEMINARS: There will be 8 seminar sessions for each of the two groups that will be assigned at the beginning of the course.

The participation is obligatory. In these sessions, combined activities of self-learning and supervised work will be developed in which topics treated in class or complementary topics will be expanded.

The format of these activities can vary from the following: Group work that will be exposed in a specific time (20 min) through ppt presentation to the rest of the class-seminar.

The subject will be chosen by the group among various proposals made by the teacher or generated by the students themselves.

TUTORIES: -To solve the doubts/ problems that arise during the self-learning process, assignment tasks or theoretical classes. They will be done individually or in small groups depending on the requirements and the areas of the issues to be discussed. The place of performance and the schedule will be taken by mutual agreement between the teacher and the student (s) concerned.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Seminars	8	0.32	3, 5, 7, 1, 2, 8
Theory	28	1.12	4, 3, 7, 6, 2
Type: Supervised			
Supervised activities	14	0.56	5, 1, 8
Type: Autonomous			
Autonomous activities	97	3.88	5, 8

Assessment

The subject will be evaluated based on the scores obtained in the two eliminatory partial examinations (with recovery), in the seminars and the proposed works, as detailed below:

1) 1st PART EXAM. Eliminatory test exam (4 options, 1 correct), and/ or short answer questions.

This partial represents 35% of the final score. With this exam we evaluate the corresponding theoretical content of the subject. A minimal score of 5 is needed to approve.

2) 2nd PART EXAM. Eliminatory test exam (4 options, 1 correct), and / or short answer questions.

This partial represents 35% of the final score. With this exam we evaluate the corresponding theoretical content of the subject. A minimal score of 5 is needed to approve.

3) RECUPERATION EXAM. Only those who have to recuperate one or two part-exams will have to submit it. It will have the same structure as the partial examinations

and will have the same weight (35% each block). It will be necessary to approve each partial with a minimum score of 5 to be able to pass the subject.

To access the recovery exam, the students must have been previously evaluated in a set of activities whose weight equals to a minimum of two thirds

of the total grade of the subject or module.

4) SEMINARS: The evaluation of the seminars will count 20% of the final grade. The oral presentation (15%) and the preliminary draft (5%) will be evaluated.

5) The remaining 10% will be distributed among the various proposals (group or individual work, assignments, participation in the forum, etc.)

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
1st part exam (theory)	35	1.5	0.06	4, 3, 7, 6, 1
2nd part exam (theory)	35	1.5	0.06	5, 1
Other assignments	10	0	0	5, 1, 8
Seminar	20	0	0	3, 1, 2, 8

Bibliography

General Mycology

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Field guides

BON, M. (1988). *Guía de campo de los hongos de Europa*. Omega. Barcelona.

CAMBRA, J., GOMEZ, A. & RULL, J. (1989). *Guía de les algues i els líquens dels Països Catalans*. Pòrtic. Barcelona.

CETTO, B. (1979-1980). *Guía de los hongos de Europa*. 3 vol. Omega. Barcelona.

COURTECUISSSE, R. & DUHEM, B. (2005). *Guía de los Hongos de la Península Ibérica, Europa y Norte de África*. Omega. Barcelona.

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- MORENO, G., GARCIA MANJON, J.L. & ZUGAZA, A. (1986). La guía INCAFO de los hongos de la Península Ibérica. 2 vol. INCAFO. Madrid.
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Web Sites of interest

DOCTOR FUNGUS - <http://www.doctorfungus.org/>

JOURNAL OF THE MYCOLOGICAL SOCIETY OF AMERICA - <http://www.mycologia.org>

LICHENS - <http://helios.bto.ed.ac.uk/bto/microbes/lichen.htm>

MYKOWEB.- <http://www.mykoweb.com/>

TREE OF LIFE - FUNGI - <http://tolweb.org/Fungi/2377>

ZOOSPORIC FUNGI ONLINE - <http://www.botany.uga.edu/zoosporicfungi/>