

**COURSE DATA****Data Subject**

Code	33973
Name	Plant and Animal Biology
Cycle	Grade
ECTS Credits	6.0
Academic year	2021 - 2022

Study (s)

Degree	Center	Acad. Period
1103 - Degree in Food Science and Technology	Faculty of Pharmacy and Food Sciences	2 First term

Subject-matter

Degree	Subject-matter	Character
1103 - Degree in Food Science and Technology	2 - General biology	Basic Training

Coordination

Name	Department
CALVO OCHOA, M CARMEN	25 - Plant Biology
CENTENO GUIL, JOSE M	190 - Physiology

SUMMARY

Plants' and Animals' Biology is a subject with a basic character, half-yearly that it is taken in the second year of the Degree in Food's Science and Technology. It has a total of 6 credits ECTS. Being a theory-experimental degree, the theory training (3,8 ECTS) is complemented by carrying out experiments in the laboratory (1,5 ECTS). These experiments include of the concept's practice and techniques learned before, making the student feel comfortable and familiarized with the scientific material and teamwork.

The Plants' and Animals' Biology together with General Biology, of first year, create an obligatory module of Biology. In "General Biology", the student acquires fundamental knowledge about the level of cellular organization from a living thing. Differences are studied morphological, structural and function between cell animal and vegetable. In the Plants' and Animals' Biology subject we go further in the study of the level of cellular organization in plants animal and organisms.



Vegetables, such as photosynthetic organisms are the main contribution of O₂ to the atmosphere and the mainstay of the food chain. The human diet is based on plant and animal products that provide fiber, vitamins, proteins, fats. On the other hand, the plants, along with the animals, they are a source of valuable raw material for the food processing industry (starches, sugars, sweeteners, antioxidants, emulsifiers, colorings, flavorings). To put forward the technological approximations aimed, among others, in obtaining a better quality of raw materials is necessary contribute a basic knowledge of the running of plants and animals. In addition, is necessary for a Food's Science and Technology student, have knowledge of the plants' and animals' diversity.

For this reason the subject is organized into teaching units. There are two teaching units for both plants and animals. The first teaching unit, Form and Function. addresses general aspects, from an evolutionary point of view and functional, the animal and plant world that may be of interest to student of CTA. In a second teaching unit, exploring the diversity, it analyzes the distinctive features of the various taxa, highlighting that are sources of products used in the agri-food industry.

The fundamental objective is that the students get a coherent vision of plant and animal diversity acquiring key concepts to get to know the complexity of the worlds of animals and plant and its importance to the agri-food industry.

PREVIOUS KNOWLEDGE

Relationship to other subjects of the same degree

There are no specified enrollment restrictions with other subjects of the curriculum.

Other requirements

It is highly recommended that apart from Biology, students have also studied mathematics, physics, and chemistry and having knowledge of the english language

OUTCOMES

1103 - Degree in Food Science and Technology

- Capacidad para transmitir ideas, analizar problemas y resolverlos con espíritu crítico, adquiriendo habilidades de trabajo en equipo y asumiendo el liderazgo cuando sea apropiado.
- Know how to apply the scientific method and acquire skills for managing the main bibliographic sources.



- Know and understand the levels of organisation of plants and animals.
- Understand and interpret animal and plant diversity.
- Know and understand the structure and function of plants and animals.

LEARNING OUTCOMES

- *To understand the functioning of equipment and basic techniques related to the matter
- * Understand, and manage the scientific terminology basic related to the subject matter
- * Learn about the organization of the body of plants
- * Know the physiological processes basic of a plant and animal that allow you to feed, grow, multiply and interacting with the environment that surrounds him
- * Know about how the environment affects a plant's and an animal's growth and development, and what kind of mechanisms do they develop to survive
- * Knows how to look for the bibliography to be able to update and expand their knowledge on a specific topic
- * To understand the functioning of equipment and basic techniques related to the subject
- * Understand and interpret scientific work related to plants and animals
- * Handled safely and efficiently in a laboratory
- * Know present and interpret the results obtained in the laboratory
- * Ability to carry out experiments, as well as analyze and interpret data and results
- * Ability to design experiments that allow us to verify the veracity of a hypothesis or theory
- * Know about the role of a food technician in the science field.



DESCRIPTION OF CONTENTS

1. PLANTS FORM AND FUNCTION

Topic 1. PLANT CONCEPT . Plants, fungi and brown algae in the tree of life. Why studying the plants and fungi in CTA. Plant Biotechnology.

Topic 2. PLANT GROWTH AND DEVELOPMENT. Division and cell expansion. Morphogenesis and differentiation. Formation of the plant body. States of development. Plant hormones in the development.

Topic 3. PLANT PROPAGATION. Sexual and asexual propagation. Plant live cycles.

Topic 4. PLANT NUTRITION AND TRANSPORT. Absorption and transportation of the water and mineral salts. Transpiration. Synthesis and transport of primary and secondary metabolites.

Topic 5. THE PLANTS WITH THE ENVIRONMENT. Responses to the light, gravity, environmental stress. Plant hormones in the stress.

2. EXPLORING PLANT DIVERSITY.

Topic 6. PLANTS WITHOUT EMBRYO : red and green algae. General characteristics. Importance to the food industry.

Topic 7. PLANTS WITH EMBRYO (I): Bryophytes and Pteridophytes. General characteristics. Importance to the food industry.

Topic 8. PLANTS WITH EMBRYO (II). Gymnosperms and Angiosperms. General characteristics. Importance to the food industry.

3. ANIMALS FORM AND FUNCTION

Topic 9. CONCEPT of ANIMAL. Historia evolutiva Su importancia en CTA.

Topic 10. ANIMAL DEVELOPMENT. Body Plans: symmetry, cavities , segmentation. Tissues ,Organs and systems. Adaptations of the development of amniotes.

Topis 11. REGULATION OF THE INTERNAL ENVIRONMENT. Homeostasis mechanisms , thermoregulation, osmoregulation in aquatic and terrestrial animals. Excretory processes and excretion systems.

Topis 12. ANIMAL NUTRITION. Need to feed themselves. Stages of the food processing. Adaptations of the digestive system of vertebrates in the diet.

Topic 13. CIRCULATION AND EXCHANGE OF GASES . circulatory system. Circulación de los vertebrados. Respiratory surfaces , gills, tracheal systems, lungs. Breathing of amphibians, mammals and birds.

Topic 14. ANIMAL REPRODUCTION. Types. Cycles and reproductive patterns. Production and transport of gametes in the animals. Clonación of farm animals.

**4. EXPLORING ANIMAL DIVERSITY**

Topic 15 Filo Poríferos. Filo Ctenóforos. Filo Cnidarios. Importance to the agri-food industry.

Topic 16. Filo Platelminos. Filo Nematodos. Filo Anélidos. Importance to the agri-food industry.

Topic 17. Filo Moluscos. Filo Equinodermos. Filo Artrópodos. Importance to the agri-food industry.

Topic 18. Filo Cordados. Subfilo Vertebrados. Importance to the agri-food industry.

5. LABORATORY SESSIONS

1.- Learning On arthropods.

2.- Learning about invertebrates Not arthropods important for human food.

3.- Learning to plant form and function

4.- Learning to classify and multiply plants.

WORKLOAD

ACTIVITY	Hours	% To be attended
Theory classes	38,00	100
Laboratory practices	15,00	100
Seminars	2,00	100
Tutorials	2,00	100
Development of group work	10,00	0
Study and independent work	30,00	0
Readings supplementary material	5,00	0
Preparation of evaluation activities	7,00	0
Preparing lectures	20,00	0
Preparation of practical classes and problem	4,00	0
Resolution of case studies	6,00	0
Resolution of online questionnaires	8,00	0
TOTAL	147,00	

TEACHING METHODOLOGY**Theory classes.**

For theory classes lectures will be given, since this method allows the lecturer to give key concepts to understanding the subject and recommend further detailed study. In some classes student participation will be used, both between students, and between students and lecturer.

Laboratory sessions.



In these classes students will be able to learn the practical applications of the knowledge gained in the theory classes.

Tutorials.

Tutorials will be carried out in small groups, where the teacher will direct students about everything related to the learning process, both in global and concrete terms, including the supervision of tasks.

Seminars.

In the seminars, students will present work previously proposed by their lecturer. Students should be able to summarize and present ideas both orally and using written summaries. Both the written preparation and the oral and written presentation must be carried out as a group (maximum four students) and all of them must participate in the presentation. After each seminar there will be a debate where the majority of the participation should be between students

During the activities, both theoretical and practical, examples of how the subject should be applied in relation to the Sustainable Development Goals (SDGs) will be given. The SDGs will also be taken into account in the proposals of topics for the coordinated seminars. This will provide students with knowledge, skills and motivation to understand and manage these SDGs, while promoting reflection and criticism.

EVALUATION

The knowledge acquired in the theoretical and practical classes will be evaluated. To be evaluated and to pass the subject, the student will have to attend the practical classes. If the pupil has registered for the first time in the subject, this requirement is extended also to the attendance to all the meeting tutorships.

The maximum qualification for each part (4.5 points), can be obtained by means of the accomplishment of a written exam that will consist of questions on the theoretical and practical classes. The questions may be test questions, short questions or development questions, related to different aspects of the subject.

TO PASS THE SUBJECT WILL BE NECESSARY TO OBTAIN AN SCORE HIGHER THAN TO 2,25 POINTS IN BOTH PARTS OF THE TEST (ANIMAL BIOLOGY AND VEGETAL BIOLOGY), AND THAT WITH THE SUM OF BOTH PARTS AND THE CONTRIBUTION OF THE COORDINATED SEMINAR, A QUALIFICATION HIGHER THAN 5 POINTS NEED TO OBTAINED.

Coordinated seminar: up to 1 point.



The content and the presentation (oral and written) of a Project will be evaluated.

First call: The students will attend a test of the subject contents at the end of the first four-month period. The students who do not attend the written theoretical-practical test, will appear as NO PRESENTADO in the official list.

The second call: If the student did not pass the subject in the first call, he can come to a second one. In it, the suspended part must be tested again. The score corresponding to the Coordinated Seminar and to the Laboratory practical classes, will be considered for the second call. The students who do not attend the written theoretical-practical test, will appear as NO PRESENTADO in the official list.

REFERENCES

Basic

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<http://www.biologie.uni-hamburg.de/b-online/e00/index.htm>

<http://www.plantcell.org/site/teachingtools/teaching.xhtml>

<http://5e.plantphys.net/index.php>

<http://croptechnology.unl.edu/pages/>

ADDENDUM COVID-19

This addendum will only be activated if the health situation requires so and with the prior agreement of the Governing Council

1. Contents

The contents initially collected in the teaching guide are maintained.

2. Volume of work and temporary planning of teaching.

The same teaching planning is maintained. Schedules of theoretical classes, practices, tutorials and seminars are respected.

3. Teaching methodology

The planning of the face-to-face theoretical classes is maintained.

Each week additional documents, images or videos may be made available to students to facilitate study.

If necessary, theoretical classes can be established by videoconference.

The practices are maintained with the original schedule, but with a capacity that complies with the health security measures, so it will be reduced if necessary.

Coordinated tutorials and seminars will be carried out in person or by videoconference, depending on the needs, maintaining the established schedules.

4. Evaluation

Evaluation of the topics of Animal Biology:

- Individual exercises proposed online or in the classroom: 20% of the total grade for the course.
- Coordinated Seminar Work: 10% of the total grade for the course. Coordinated seminars may be conducted in person or by videoconference.
- Final exam: 70% of the total grade for the course. There will be an examination of all the material, both theoretical and practical, in person. The exam will present test or true / false questions. To pass the course it will be necessary to obtain at least 4.5 points in the exam grade and that when adding the notes of the individual exercises and the Coordinated Seminar the score is at least 5 points. This examination may also be carried out electronically if necessary.

Evaluation of the topics of Plant Biology:

- Individual exercises related to the practices, proposed electronically or in the laboratory: 10% of the total grade for the course
- Final exam: 80% of the total grade for the course. There will be an examination of all the material, both theoretical and practical, in person. The exam will present test or true / false questions. To pass the course it will be necessary to obtain at least 4.5 points in the exam grade and that when adding the notes of the individual exercises and the Coordinated Seminar the score is at least 5 points. This examination may also be carried out electronically if necessary.



The final grade for the course will be the average of the grade obtained in each part of the course (Animal Biology and Plant Biology).

Students who do not achieve the pass grade in the first call must sit an exam of all the theoretical and practical subjects of the course in the second call, which will have the same characteristics as the first, and which will also consider the practical notes, Coordinated seminar and individual exercises.

5. Bibliography

The recommended bibliography is kept as it is accessible. The teacher will also provide information through the Virtual Classroom.