

Degree	Type	Year
Food Science and Technology	OB	1

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Teaching groups languages

You can view this information at the [end](#) of this document.

Prerequisites

There are no official prerequisites, but the student should acquired the knowledge based on the principles of Biology studied during the previous semester, which will facilitate the understanding of the factors that contribute to plant and animal production

Objectives and Contextualisation

This first-year basic education course develops the scientific and technical bases used to improve the performance and quality of food from plant and animal origin for their commercialization in agreement with the current requirements of consumers and the agri-food industry.

The specific training objectives are:

- 1) Acquire the fundamental knowledge of the foundations of plant and animal production, the different production systems, and their sustainability.
- 2) Knowing the main techniques used to obtain, conserve, and transform products of plant and animal origin of the highest yield and of the highest possible quality.

- 3) Knowing the main vegetable and animal species used in food, their productive objectives, and the different forms of use.
- 4) Understand the relationship between botanical, physiological, environmental factors, production system, harvesting, post-harvest, and the chemical composition and quality of the raw materials and foods obtained.
- 5) Knowing the factors, both intrinsic and extrinsic, that influence the characteristics of products of plant and animal origin

Competences

- Display knowledge of the physical, chemical, biochemical and biological properties of raw materials and foods.
- Identify the sources and the variability of raw materials in order to predict their impact on processing and food.
- Show understanding of the mechanisms by which raw materials deteriorate and the reactions and changes that take place during storage and processing, and apply the methods for controlling this.
- Take account of social, economic and environmental impacts when operating within one's own area of knowledge.

Learning Outcomes

1. Define the biochemical processes of fruit and vegetable ripening.
2. Describe the methods for controlling the deterioration of raw materials of plant and animal origin.
3. Describe the principal raw materials and classify them in terms of their usefulness in nutrition.
4. Describe the processes of plant respiration and transpiration.
5. Enumerate the factors that influence the obtainment of raw materials of animal origin during the farm production cycle.
6. Identify the economic importance of raw materials in relation to their origin and production.
7. Identify the importance of correct timing in crop-picking, in terms of the product's destination.
8. Relate the factors of plant production to the chemical composition of the products.
9. Relate the intrinsic and extrinsic factors that influence the obtainment of raw materials of plant and animal origin to the composition and properties of the above products.
10. Relate the production systems of raw materials of plant and animal origin to their composition and properties.
11. Take account of social, economic and environmental impacts when operating within one's own area of knowledge.

Content

MASTER CLASSES

PART I. CROP PLANTS AND THE ENVIRONMENT

Lesson 1. Introduction to plant production. Origin and evolution of agriculture. Concepts. Targets. Scientific and technical bases of plant production. Classification of production systems. Classification of foods of plant origin.

Lesson 2. Plant growth and development factors. Concepts of growth and development. External factors that affect growth: solar radiation, temperature, water, and soil. Internal factors affecting growth: plant growth regulatory substances, genetic composition.

Lesson 3. The soil. Soil formation and physical-chemical properties. Mineralization and humification. Clay-humic complex and cation exchange capacity. Soil organisms

Lesson 4. Mineral nutrition of plants. Essential elements. Absorption of nutrients. Symptoms of deficiency and toxicity. Hydroponic crops.

PART II. TECHNOLOGY OF PLANT PRODUCTION

Lesson 5. Soil Fertilization. Concept and classification of fertilizers. Inorganic, organic, and other fertilizers. Choice, application, and errors in the use of fertilizers. Correction of land properties: amendments.

Lesson 6. Water and irrigation systems. Water and cultivated plants. Quality of the water for irrigation. Irrigation systems. Irrigated land. Irrigation and environment

Lesson 7. Protected cultivation. Concept. Types of protection. Covering and support materials. Greenhouse classification. Control of environmental factors.

Lesson 8. Weeds. Definition. Damage caused by weeds. Classification. Weed control. Types of herbicides and dangers of their use.

Lesson 9. Diseases of plants. Definition. Disease or pest agents. Development and identification of diseases. Fighting and control methods. Use of pesticides.

Lesson 10. Propagation of cultivated species. Sexual propagation: hybrids, varieties, pure lines. Asexual propagation: grafting techniques, rootstocks, layering. Techniques of micropropagation. Tissue culture.

Lesson 11. Herbaceous crops I. Cereals. General characteristics of cereals. Types of cereals.

Lesson 12. Herbaceous crops II. Legumes and oilseeds. Other crops of interest. Rotation and alternative crops.

Lesson 13. Cultivated vegetables. Classification. Crop requirements. Cultural operations. Natural enemies and pests.

Lesson 14. Woody crops I. Economic importance. Main products. The vineyard plantation. Vineyards for wine making and direct consumption. Olive tree cultivation

Lesson 15. Woody crops II. Temperate zone fruit tree cultivation. Fleshy fruits and nuts. Citrus fruit culture. Tropical and subtropical fruit crops.

PART III. INTRODUCTION TO ANIMAL PRODUCTION

Lesson 16. Introduction to the food production of animal origin. Definition of zootechnics and animal production. Evolution of animal production. Production of meat from different species (pork, poultry, beef, and sheep), milk and eggs in the world, the EU, Spain, and Catalonia.

Section A: PRODUCTION OF MILK

Lesson 17. Milk from cows and other species. Milk: physical-chemical definition. Composition of milk and relationship between components. Chemical composition of milk from different mammalian species. Quality of milk. Productive factors that influence the sanitary and bromatological quality of milk.

Lesson 18. The mammary gland. Functional structure of the udder. Physiology of milk production. The fractions of milk in the udder, the dairy aptitude, and milking routines. The milking machine.

Lesson 19. Lactation curve. Amount and composition. Lactation curve. Standardization and modeling of the lactation curve. Factors that condition milk production and composition

Lesson 20. Production cycle of dairy animals. Description of the productive cycle: calving, lactation, mating, and drying. Life cycle of dairy cows, sheep, and goats. Dairy breeds.

Section B: PRODUCTION OF EGGS

Lesson 21. The commercial egg. Productive sector. Productive cycle of laying hens. Egg production curve for a laying flock. Description of the productive sector. Traceability (Identification and Labeling). Egg labels (organic, free-range, barn, and cage). Classification, storage, and marketing of eggs.

Lesson 22. Structure and formation of the egg. Structure, composition, and functions of the different parts of the egg. Differences between species. Egg formation process and alterations.

Lesson 23. Egg quality. Factors affecting eggshell quality and egg internal quality (albumen and yolk) in laying hens. The effect of storage time on egg quality.

Section C: PRODUCTION OF MEAT

Lesson 24. Muscle and meat. Definition of meat. Macroscopic and microscopic structure of the muscle.

Lesson 25. Growth and development. Definition. Stages. The main factors that affect the growth rate. Forms of growth expression. Modifications due to development. Concept of precocity. The main factors that affect the development rate.

Lesson 26. The carcass. Process from the farm to the consumer. Definition of carcass and fifth quarter. Transformation of the live animal in carcass and offal. Chain of sacrifice. Carcass yields. Commercial carcass classification by species. Evolution of the muscle between slaughter and meat consumption. DFD and PSE meats. Muscle abnormalities in the broiler (wooden-breast, White Striping,...). Productive factors that influence the organoleptic characteristics of meat.

Lesson 27. Pig, poultry, and rabbit production. Biological and productive cycle of swine and rabbit species. Crossings, handling, and farm types. Structure of poultry production. Productive cycle of broilers, other varieties of chicken meat, and turkey.

Lesson 28. Production cycle of ruminants for meat. Productive cycle of beef, lamb, and goats. Types of meat. Breeds.

Section D: AQUACULTURE

Lesson 29. Production cycle of molluscs and crustaceans. Main species of molluscs and crop crustaceans. Biological and productive cycle. Type of culture.

Lesson 30. Production cycle of fish. Main marine and freshwater species of commercial interest. Biological and productive cycle. Type of culture

SEMINARS

S1. Agriculture and environment. Alternative agriculture (1.5h).

S2. Applications of Biotechnology to Plant Production (1.5h).

S3. Quality and conservation of plant products (1h).

S4. Glossary and basic concepts about Animal Production (1h).

S5. Sustainable Development Goals (SDGs) (1h).

S6. Swine production. The problem of pig slurry (1.5h)

PRACTICAL CLASSES

P1. The soil. Physical and chemical properties (5 h)

P2. Recognition of raw materials and foods of plant origin (2.5 h)

P3. Influence of different intrinsic and extrinsic factors on the quantity and characteristics of the eggs and milk produced (2.5 h)

P4 Visit to the UAB farms (2.5h)

P5 Influence of different intrinsic and extrinsic factors on the characteristics of the meat produced (2.5 h)

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Master classes	30	1.2	1, 2, 4, 3, 5, 7, 6, 8, 9, 10
Practical lessons	15	0.6	3, 8, 9, 10
Seminars	7.5	0.3	2, 5, 7, 8, 9, 10
Type: Supervised			
Student tutoring	4.5	0.18	1, 2, 3, 5, 7, 6, 8, 9, 10
Type: Autonomous			
Self study	60	2.4	1, 2, 4, 3, 5, 7, 6, 8, 9, 10
Self-learning work	30	1.2	9, 10

The methodology used in this subject to achieve the learning process is based on the fact that students work on the information that is available to them. To achieve this goal, the subject is based on the following activities:

Master classes: With these classes the student acquires the basic scientific-technical knowledge of the subject that must be completed with the personal study of the topics explained. During the theoretical classes of the Part III products of animal production origin, several training activities will be carried out and will be evaluated.

Seminars: Seminars are sessions with a small number of students where the scientific-technical knowledge exposed to the master classes are worked to complete their comprehension and deepen each one, favoring the discussion, exchange of ideas, capacity of analysis and synthesis and critical reasoning. In the seminars there will be several activities that will be evaluated.

Practical lessons: The objective of the practical lessons is to complete, apply and reinforce the knowledge acquired in the master classes and seminars. During the laboratory and farm practical sessions, students will work on different materials (soils, seeds, flours, plants, ...), performing different types of analysis and observations. In the classroom practices, students will be asked about different issues that will have to be resolved.

Self-learning work: The students will do two case studies. It is intended that the student from a real situation can solve a problem posed. The mission of the case study is to promote the capacity for analysis, reasoning and expertise in the resolution of problems related to the professional field.

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.

Assessment

Continuous Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Partial exams (2)	70% (35% Plant+35% Animal)	3	0.12	11, 1, 2, 4, 3, 5, 7, 6, 8, 9, 10
Practical lessons	10%	0	0	3, 8, 9, 10
Self-learning	20%	0	0	11, 9, 10

To evaluate the degree of achievement of the competencies, the following instruments will be counted:

Exams: The students' knowledge will be assessed individually in theory, seminars, and practices, as well as their capacity for analysis and synthesis. Two written tests of type test and/or short questions will be made. The two partial exams will mediate between them as long as the marks obtained are at least 4.5:

- Part Production of Raw Materials of Plant Origin: The theoretical grade of the plant part is 95% of the exam grade plus 5% of the average grade of the 3 seminars.
- Production of Raw Materials of Animal Origin: The activities carried out during the theoretical classes and seminars can score 0.5 points, which will be added to the grade of the partial exam.

The final mark of the theory part will be the average between the marks of the two parts. The students who do not score a minimum of 5 after completing the two partial tests will have a second chance. This evaluation weights the final mark of 70%.

Practical lessons: The practical sessions are mandatory and will be evaluated individually. This evaluation has a global weight of 10%.

Case study: The capacity for synthesis and coherence will be assessed in the discussion of results and decision making and will have a value of 20% on the final mark of the subject.

To pass the subject, it is essential to have passed the theory part (≥ 5) and have attended a minimum of 80% of the practical lessons.

Single assessment

Exam. The single assessment will consist of a single summary test in which the contents of the theory program, seminars, and practicals of the subject will be assessed. The test will consist of quiz-type questions (single-answer multiple choice) and/or short-answer questions. The exam will have two distinct parts (Vegetable and Animal) and will weigh the final grade of 70%, distributed in 35% Vegetable and 35% Animal. To pass the exam and be able to make the average with the other assessment activities, it is necessary to obtain a minimum grade of 5/10. This grade can be obtained by averaging the 4.5 grade of one of the two parts. The assessment date will be the same date set in the subject's schedule for the last continuous assessment test (second partial).

Students who do not obtain a grade ≥ 5 may take the make-up exam following the same criteria as for the continuous assessment.

Practical lessons. The practical sessions are mandatory and will be evaluated individually. This evaluation has an overall weight of 10%. Practice reports will be delivered on the same day and time of the single test (date of the second partial continuous assessment). Case study. The capacity for synthesis and coherence in the

discussion of the results and decision-making will be assessed and will have a value of 20% on the final grade of the subject. The Case study assignment will be handed in, on the day of the single test (date of the second partial continuous assessment).

Case study. The capacity for synthesis and coherence in the discussion of the results and decision-making will be assessed and will have a value of 20% on the final grade of the subject. The Case study assignment will be handed in, on the day of the single test (date of the second partial continuous assessment).

To pass the subject, it is essential to have passed the theory part (≥ 5) and to have attended a minimum of 80% of the practical sessions.

The review of the final grade will follow the same procedure as for continuous assessment. Students who are evaluated by a single evaluation and do not pass the subject will be able to recover it on the same day as the rest of the students

It will be considered that a student is not assessable if he has participated in assessment activities that represent $\leq 15\%$ of the final grade

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PPM Vegetal

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PPM Animal

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Web links

- + Comisión Europea, Agricultura y Desarrollo Rural: http://ec.europa.eu/agriculture/index_es.htm
- + DAAM (Departament d'Agricultura, Ramaderia, Pesca, Alimentació i Medi Natural):
<http://www20.gencat.cat/portal/site/DAR/>
- + FAO (Food and Agriculture Organization): <http://www.fao.org/>
- + Informació agrària: <http://www.infoagro.com/>
- + AEMet (Agencia Estatal de Meteorología): <http://www.aemet.es/es/serviciosclimaticos>
- + MAPA (Ministerio de Agricultura, Pesca y Alimentación): <http://www.> <https://www.mapa.gob.es/>
- + Servei meteorològic de Catalunya: <http://www.gencat.net/servmet/>

Software

None in particular

Groups and Languages

Please note that this information is provisional until 30 November 2025. You can check it through this [link](#). To consult the language you will need to enter the CODE of the subject.

Name	Group	Language	Semester	Turn
(PAUL) Classroom practices	1	Catalan/Spanish	second semester	morning-mixed
(PAUL) Classroom practices	2	Catalan/Spanish	second semester	morning-mixed
(PLAB) Practical laboratories	1	Catalan/Spanish	second semester	morning-mixed
(PLAB) Practical laboratories	2	Catalan/Spanish	second semester	morning-mixed
(PLAB) Practical laboratories	3	Catalan/Spanish	second semester	morning-mixed
(PLAB) Practical laboratories	4	Catalan/Spanish	second semester	morning-mixed

(SEM) Seminars	1	Catalan	second semester	morning-mixed
(SEM) Seminars	2	Catalan	second semester	morning-mixed
(SEM) Seminars	3	Catalan	second semester	morning-mixed
(SEM) Seminars	4	Catalan	second semester	morning-mixed
(TE) Theory	1	Catalan/Spanish	second semester	morning-mixed