

PLAN DOCENTE DE LA ASIGNATURA

Curso académico: 2026/2027

Identification and characteristics of the course				
Code	501137		ECTS Credits	6
Course name (English)	Field Crops			
Course name (Spanish)	Cultivos Herbáceos Extensivos			
Degree programs	Grado en Ingeniería de las Explotaciones Agropecuarias Grado en Ingeniería Hortofrutícola y Jardinería			
Faculty/School	Escuela de Ingenierías Agrarias			
Semester	6º	Type of course	Compulsory	
Module	Specific Technology: Explotaciones Agropecuarias			
Matter	Technology of Crop production			
Lecturer/s				
Name		Office	E-mail	Web page
María José Poblaciones Suárez-Bárcena		D724	majops@unex.es	
Carlos García Latorre Nieto		D730	cgarcialn@unex.es	
Subject Area	Crop Production			
Department	Ingeniería del Medio Agronómico y Forestal			
Coordinating Lecturer (If more than one)	María José Poblaciones Suárez-Bárcena			

Competencies
CB1 - Students have demonstrated knowledge and understanding of an area of study which builds on the foundation of general secondary education, and is usually at a level which, while supported by advanced textbooks, also includes some aspects which involve knowledge from the cutting edge of their field of study, CB2 - Students should be able to apply their knowledge to their work or vocation in a professional manner and possess the competences usually demonstrated through the development and defence of arguments and problem solving within their field of study CB3 - Students should have the ability to gather and interpret relevant data (usually within their field of study) to make judgements which include reflection on relevant social issues, scientific or ethical CB4 - That students can transmit information, ideas, problems and solutions to both specialised and non-specialised audiences CB5 - That students have developed the learning skills necessary to undertake further studies with a high degree of autonomy CG7 - Knowledge in basic scientific and technological subjects that allow for continuous learning, as well as the ability to adapt to new situations or changing environments.

GC8 - Ability to solve problems with creativity, initiative, methodology and critical reasoning.

GC9 - Capacity for leadership, communication and transmission of knowledge, skills and abilities in the social spheres of action.

GC10 - Ability to research and use the rules and regulations relating to their field of action.

GC11 - Ability to develop activities in the field of their speciality, assuming a social, ethical and environmental commitment in harmony with the reality of the human and natural environment.

GC12 - Ability to work in multidisciplinary and multicultural teams.

CT1 - Mastery of ICT

CETE2 - Plant production technologies. Production and exploitation systems. Crop protection against pests and diseases. Technology and systems of cultivation of herbaceous species. Agroenergetics.

CERA2 - Basics of plant production, production, protection and exploitation systems.

Contents

Course outline*

Scientific and technological studies of field crops. Characteristics of the main species of field crops (cereals, legumes and industrial crops) related to taxonomic, morphological, physiological, ecological, varietal and crop technology aspects. Energy crops and new uses.



Course syllabus

Block I: Introduction

Name of lesson 1: **Introduction to field crops**

Contents of lesson 1: Crops Science concept. Differences between extensive and intensive crops. Main characteristics of Cereal.

Block II: Cereals

Name of lesson 2: **Cereal generalities**

Contents of lesson 2: Importance of winter cereals in the world, Europe and Spain. Botany, morphology, physiology and ecology of cereals.

Name of lesson 3: **Cereal production technology**

Contents of topic 3: Tillage and soil preparation, sowing, fertilization, irrigation, weeds, pests and diseases and harvesting of cereals.

Name of lesson 4: **Wheat**

Contents of lesson 4: Introduction. Botany. Morphology, physiology and ecology. Breeding and management.

Name of lesson 5: **Barley**

Contents of lesson 5: Introduction. Botany. Morphology, physiology and ecology. Breeding and management.

Name of lesson 6: **Other cereals**

Contents of lesson 6: Oat, rye, triticale and others.

Name of lesson 7: **Corn**

Contents of lesson 7: Introduction. Botany. Morphology, physiology and ecology. Corn breeding and management.

Name of lesson 8: **Rice**

Contents of lesson 8: Introduction. Botany. Morphology, physiology and ecology. Rice breeding and management.

Competences of the block: CG7, CB1, CB5, CT1, CERA1, CERA2, CETE2

Block III: Legumes

Name of lesson 9: **Legumes**

Contents of lesson 9: Legumes in agriculture. Agronomic characteristics. Objectives of genetic improvement in grain legumes. Quality of grain legumes. Legumes and sustainability. Grain legumes in the world, Europe and Spain.

Name of lesson 10: **Vicia genus**

Contents of lesson 10: Introduction. Botany. Morphology, physiology and ecology. Faba bean breeding and management.

Name of lesson 11: **Field peas**

Contents of lesson 11: Introduction. Botany. Morphology, physiology and ecology. Pea breeding and management.

Name of lesson 12: **Chickpea**

Contents of lesson 12: Introduction. Botany. Morphology, physiology and ecology. Chickpea breeding and management.

Name of lesson 13: **Other legumes**

Contents of lesson 13: Faba bean. Lentils. Lupins. Penaut. Soya. Other species.

Competences of the block: CG7, CB1, CB5, CT1, CERA1, CERA2, CETE2

Block IV: Industrial crops

Name of lesson 14: **Industrial crops**

Contents of lesson 14: Introduction to Industrial Crops. Definition and generalities. Classification according to industrial use. Non-Food Crops (NFCs)

Name of lesson 15: **Beetroot**

Contents of lesson 15: Introduction. Botany. Morphology, physiology and ecology. Beetroot breeding and management.

Name of lesson 16: **Sunflower**

Contents of lesson 16: Introduction. Botany. Morphology, physiology and ecology. Sunflower breeding and management.

Name of lesson 17: **Tobacco**

Contents of lesson 17: Introduction. Botany. Morphology, physiology and ecology. Tobacco breeding and management.

Name of lesson 18: **Other industrial Crops**

Contents of lesson 18: Fibers producers: cotton, linen, hemp, kenaf and others. Oilseeds: rapeseed, safflower, castor oil plant and others. Bioenergy crops: bioethanol, biodiesel and biomass.

Competences of the block: CG7, CB1, CB5, CT1, CERA1, CERA2, CETE2

Practical contents

Name of lesson 19: Practice 1: **CEREAL DIFFERENCIATION**

Contents of lesson 19: Recognition and distinction between cereals in each of their growth phases.

Name of lesson 20: Practice 2: **PHYSICAL, CHEMICAL AND TECHNOLOGICAL PROPERTIES OF CEREALS.**

Contents of lesson 20: Review of the determination of the main physical and technical characteristics of the seeds: percentage of impurities, hectolitre weight, 1000-grain weight, germination power and relative value, determination of the vitrosity percentage, the sedimentation index or Falling number, the wet and dry gluten content as well as the parameters of the Chopin Alveographs.

Name of lesson 21: Practice 3: **PHENOLOGICAL STATUS OF CEREALS**

Contents of lesson 21: Sow and follow-up of germination-emergence phases, vegetative development, grain filling and maturation. Determination of fertilization and phytosanitary treatments.

Name of lesson 22: Practice 4: **LEGUMES DIFFERENCIATION**

Contents of lesson 22: Recognition and distinction between legumes in each of their growth phases.

Name of lesson 23: Practice 5: **INDUSTRIAL CROPS DIFFERENCIATION**

Contents of lesson 23: Recognition and distinction between industrial crops in each of their growth phases

Name of lesson 24: Practice 6: **REALIZATION OF A WORK**. Carrying out a research work including all phases: experimental design, management, data collection, statistical analysis, literature search and writing of a scientific paper.

Content of lesson 24: A research trial will be carried out, including all phases, on the effect of the application of different fertilisers and doses or other products on different cereals and/or leguminous plants to establish the effects on phenology and growth parameters. This will be done through literature research, experimental design, management, data collection, statistical analysis, drafting of a scientific paper and its presentation and defense.

Name of lesson 26: Practice 8: **MOODLE ACTIVITIES**

Contents of lesson 26: Realization of different activities that will be proposed in moodle along the academic year.

Competences: CG10, CG11, CG12, CG5, CG6, CG8, CG9, CB1, CB2, CB3, CB4, CB5, CT1, CERA2, CETE2

Educational activities *

Student workload in hours by lesson		Lectures	Practical activities				Monitoring activity	Homework
Lesson	Total	L	HI	LAB	COM	SEM	SGT	PS
0	0.5	0.5						
1	2	1						1
2	6	3						3
3	11	4.5						6.5
4	5	3						2
5	4	2						2
6	5	2						3
7	5	2						3
8	5	2						3
9	4	2						2
10	3.5	1.5						2
11	3.5	1.5						2
12	3.5	1.5						2
13	5	2						3
14	4	1						3
15	3	1						2
16	4	2						2
17	4	2						2
18	3	1						2
19	6.5			3			1	2.5
20	3			2				1

21	6			2.5			1	2.5
22	6			2.5			0.5	3
23	5.5			2			0.5	3
24	30.5			8			4.5	18
25	2.5			2.5				
26	7							7
Evaluation	2	2						
TOTAL	150	37.5		22.5			7.5	82.5

L: Lectures (85 students)

HI: Hospital internships (7 students)

LAB: Laboratory or field practices (15 students)

COM: Computer room or language laboratory practices (20 students)

SEM: Problem classes or seminars or case studies (40 students)

SGT: Scheduled group tutorials (educational monitoring, ECTS type tutorials)

PS: Personal study, individual or group work and reading of bibliography

Teaching Methodologies*

The methods to be used for the student to obtain the necessary competences for the development of the future profession will be:

1. Lectures and discussion of theoretical contents
2. Problem development
3. Laboratory and field practices
4. Case Studies
5. Practical lessons in the pc room
6. Development of seminars
7. Use of the virtual classroom
8. Visits
9. Study of the subject
10. Search and management of scientific bibliography
11. Conducting examinations

Learning outcomes *

RA72. Students should obtain the ability to work in multidisciplinary and multicultural teams.

RA137. Know the current situation and characteristics of the main species of Extensive Herbaceous Crops with regard to taxonomic, morphological, physiological, ecological and varietal aspects.

RA138. Know the cultivation technology applied to the main Extensive Herbaceous Crops, including tillage, sowing, weed control, fertilisation, soil moisture control, crop defence, harvesting, conservation and transformation of crops and the use of by-products.

RA139. Be able to analyse the impact that the above techniques will have on the development and production of crops, as well as on the quality of the obtained production.

RA140. Be able to apply the acquired knowledge to real and concrete situations in order to be able to decide, plan, direct and evaluate the implementation of arable crops on a farm.

RA141. Be able to visually recognise the main species of Extensive Herbaceous Crops in any of their growth stages (including the seed).

RA155. Be able to find updated information (from bibliography, internet, etc.) on different aspects and problems of the different subjects.

RA156. Have a critical and comprehensive vision when reading different technical and scientific documents related to different subjects.

RA157. Verbally express specialised knowledge with precision and argumentation.

RA158. Be able to work efficiently in a group.

RA159. Students will have the ability to gather and interpret relevant data, within the area of agroforestry engineering, in a way that allows them to make judgements that include a reflection on relevant social, scientific or ethical issues.

RA12. Introduce students to the technical and scientific terminology of the English language in different aspects related to the different subjects.

Assessment systems *

1. Final exam (80%): theoretical and practical knowledge acquired during the course delivery by a written final exam consisting of two parts: theory test (70%) and practice exam (10%). It is necessary to pass both exams (minimum mark half of the considered value). The theory exams will consist of questions related to the syllabus taught, which will be marked, if answered correctly, according to the value given in the exam itself. Questions with incorrect answers may be deducted up to 1 right answer. The practical exams will consist of the visual identification of the crops studied during the course. It is necessary to pass both exams to pass the course.

2. Continuous evaluation (15%): Degree of achievement of practical skills and capacity for integration with theoretical knowledge. Use and participation in theoretical and practical classes through direct questions to groups of students and discussion of the results. Carrying out and presentation of the research during the course, which will include the design of the essay, handling, data collection, writing, delivery and presentation of a team work to be agreed with the teacher**. The student will write and hand in a field book on the monitoring of one of the existing crops in the practical fields

3. Assistance with academic achievement (5%): Attendance with use of face-to-face activities (5%): Innovation, creativity and consultation of resources in the resolution of activities proposed during the course of the theoretical classes using the computer classroom as a support whenever possible. Each student, individually or in teams, will submit a summary of the activities carried out.

A SINGLE COMPREHENSIVE FINAL EXAMINATION*:

Final written exam which will have two parts: the first part (80%) which will consist of two parts: theory exam (70% of the mark) and practical exam (10% of the mark). The theory exams will consist of questions related to the syllabus taught, which will be marked, if answered correctly, according to the value given in the exam itself. The practical exams will consist of visual identification of the crops studied during the course. It is necessary to pass both exams (minimum mark half the value considered) in order to pass the course. The second part (20%) will be the result, on the one hand, of the completion and presentation of a work to be agreed with the teacher** and, on the other hand, of the

attendance of 10% of the practical classes determined before the beginning of the course due to the difficulty that the evaluation of the learning outcomes entails

Bibliography (basic and complementary)

BASIC BIBLIOGRAPHY

- CARRASCO, J. M.; LOZANO, M. J.; PÉREZ, F. 1997. *Leguminosas de grano. Tecnología de cultivo*. Hojas divulgadoras (2/97) de la Junta de Extremadura. Badajoz.
- GUERRERO, A. 1999. *Cultivos herbáceos extensivos*. Ediciones Mundi-Prensa. 6ª Edición. Madrid.
- LÓPEZ-BELLIDO, L. 1991. *Cultivos herbáceos*. Los Cereales. Ediciones Mundi-Prensa, Madrid, España.
- LÓPEZ-BELLIDO, L. 2002. *Cultivos industriales*. Ediciones Mundi-Prensa, Madrid, España.
- NADAL, S.; MORENO, M.T.; CUBERO, J. I. 2004. *Las leguminosas grano en la agricultura moderna*. Ediciones Mundi-Prensa y Junta de Andalucía. Madrid.
- OSCA LLUCH, J. M.; 2004. *Cultivos herbáceos extensivos: cereales*. Universidad Politécnica de Valencia.

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- ALBA-ORDOÑEZ, A.; LLANOS-COMPANY, M. 1990. *El cultivo del girasol*. Agroguias Mundi-Prensa. Madrid.
- DE MIGUEL, E. 1991. *El garbanzo, una alternativa para el seco*. Ediciones Mundi-Prensa. Madrid.
- FORNÉS, J. 1983. *Cultivo de habas y guisantes*. Editorial Sintet, S.A. Barcelona.
- FRANQUET, J. M.; BORRÁS, C. 2006. *Economía del arroz: variedades y mejora*. Edición electrónica. Texto completo en www.eumed.net/libros/2006a/fbbp/
- LLANOS COMPANY, M. 1984. *El maíz: su cultivo y aprovechamiento*. Ediciones Mundi-Prensa. Madrid.
- MOLINA CANO, J. L. 1989. *La cebada: morfología, fisiología, genética, agronomía y usos industriales*.
- MORILLO-VELARDE, R.; BOHÓRQUEZ, A.; SOTO, A. 1986. *Normas de cultivo de la remolacha azucarera de siembra otoñal*. Serie Monografías nº2 de la Junta de Andalucía. Sevilla.
- TINARELLI, A. (VERSIÓN ESPAÑOLA POR CARRERES ORTELLES, R. M.). 1989. *El arroz*. Mundi-Prensa. Madrid.

Other resources and complementary educational materials

The student has material related to the subject in the library, material on which the teachers base their agenda.

The facilities of the School of Agrarian Engineering will be used to carry out work that may be of interest to the student or that may facilitate the expansion of his knowledge and skills.

The student will have access from the first moment to the resources of the virtual platform of the subject, through which he will be able to communicate with the teaching staff and other colleagues, as well as download the file of the subject, with the program and the evaluation criteria.

The teacher-student interaction will be carried out thanks to the e-mail addresses and forums of the virtual platform, as well as small evaluations through questionnaires included in the web.