Universitat de Lleida

DEGREE CURRICULUM

BROADACRE CROPS

Coordination: SAVÍN PARISIER, ROXANA

Academic year 2020-21

BROADACRE CROPS 2020-21

Subject's general information

Subject name	BROADACRE CROPS
Code	102552
Semester	2nd Q(SEMESTER) CONTINUED EVALUATION
Typology	

Degree	Course	Character	Modality
Bachelor's Degree in Agricultural and Food Engineering	3	COMPULSORY	Attendance-based

Course number of credits (ECTS)	9
Type of activity, credits, and groups	

Activity type	PRACAMP	PRALAB	TEORIA
Number of credits	1.6	1.4	6
Number of groups	1	1	1

Coordination	SAVÍN PARISIER, ROXANA
Department	CROP AND FORESTRY SCIENCES
Teaching load distribution between lectures and independent student work	Horas presenciales: 90 Horas no presenciales: 135
Important information on data processing	Consult this link for more information.
Language	Catalán: 50% Castellano: 50%

BROADACRE CROPS 2020-21

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
SANTIVERI MORATA, FRANCISCA	paquita.santiveri@udl.cat	4,5	
SAVÍN PARISIER, ROXANA	roxana.savin@udl.cat	4,5	

Subject's extra information

Field Crops is the most specific subject about the field crop production. It is based on the knowledge taught in the subject Technology of Herbaceous Crops during the first semester of the third year, and includes the physiological bases that influence the response of species to different cultivation techniques. It is, therefore, a finalist integrative subject that aims for students, from prior knowledge, to understand how a crop works and be able to design the most appropriate management to optimize crop yields within an agricultural system.

Recommendations
It is advisable to have studied and assimilated correctly the subject 'Herbaceous Crop Technology' corresponding to the first semester.

Learning objectives

The objectives to be achieved include:

RA1: Identify the physiological processes that determine yield in extensive crops
RA2: Analyze their physiology and their relationship with the management of the main field crops
RA3: Evaluate the influence of different cultivation techniques on the yield of field crops
RA4: Describe the most suitable cultivation technology for each species depending on the growing conditions
RA5: Understand the characteristics of the main production systems.

Competences

General skills

CG6. Ability to direct and manage all kinds of agri-food industries, farms and livestock, urban and / or rural green spaces, and public or private sports areas, with knowledge of new technologies, quality processes, traceability and certification and the techniques of marketing and marketing of food products and cultivated plants

CG8. Ability to solve problems with creativity, initiative, methodology and critical reasoning.

CG11. Ability to develop their activities, assuming a social, ethical and environmental commitment in tune with the reality of the human and natural environment.

CG12. Ability to work in multidisciplinary and multicultural teams.

Specific skills

CEEA2. Plant production technologies. Production and exploitation systems. Protection of crops against pests and diseases. Technology and systems for growing herbaceous species. Agroenergy.

Subject contents

Theory

I. Physiological bases of extensive crop production (16 hours)

Topic 1. Introduction to crop production: Evolution of yields. The Green Revolution and its consequences on the intensification of production (2 hours).

Topic 2. Ecology of extensive crops. Biotic and abiotic factors influencing species adaptation (2 hours).

Topic 3. Development: phenological cycle. Description of the development of extensive crops. Vegetative, reproductive and maturity period. Generation of organs. Phenological development scales (4 hours)

Topic 4. Crop growth: Accumulation and partition of dry matter, intercepted radiation and efficiency of radiation use (4 hours).

Topic 5. Mineral nutrition. Nutrient absorption. Efficiency of nutrient use (2 hours).

Topic 6. Use of water. Crop response to water availability. Water use efficiency (2 hours).

II. Physiology and management of extensive crops (24 hours)

Topic 7. Wheat. Ecophysiology of wheat. Analysis of the crop response to planting techniques, nitrogen fertilization and water availability (6 hours).

Topic 8. Corn. Ecophysiology of corn. Analysis of the crop response to planting techniques, nitrogen fertilization and water availability (6 hours).

Topic 9. Sunflower. Ecophysiology of the sunflower. Analysis of the crop response to planting techniques, nitrogen fertilization and water availability (2 hours).

Topic 10. Alfalfa. Ecophysiology of alfalfa. Analysis of the crop response to planting techniques, mowing frequency, nitrogen and potassium fertilization and water availability (6 hours).

Topic 11. Production of fodder. Most important forages. Cultivation techniques and their effects on yield (4 hours).

III. Cultivation systems (8 hours)

Topic 12. Fallow. Characteristics of the fallow land. Type of fallow. Advantages and disadvantages of using fallow land (2 hours).

Topic 13. Monoculture vs. crop rotations. Definitions. Advantages and disadvantages of monoculture and crop rotations (4 hours).

Topic 14. Associated crops. Characteristics of associated crops. Advantages and disadvantages of using associated crops (2 hours).

Practical activities

Laboratory and field practices (14 hours)

Practice 1.- Recognition of the main stages of phenological development (6 hours)

Practice 2.- Determination of the interception of the radiation: methodology and interpretation of the results (2 hours).

Practice 3.- Determination of growth and performance components: methodology and interpretation of results (2 hours)

Practice 4.- Use of nutrients. Determination of the nutritional status of crops. Interpretation of results (2 hours).

Practice 5.- Use of water. Determination of water status of crops. Interpretation of results (2 hours)

Workshops - Case resolution (8 hours)

Workshop 1. Crop ecophysiology

Workshop 2. Winter corn and cereals

Workshop 3. Sunflower and fodder

Workshop 4. Cultivation systems

Field trips and visits program (20 hours)

1.- Trials of winter cereal varieties (4 hours).

2.- Visit to the cooperative of Almacelles, trials of corn and agricultural exploitation (4 hours).

3.- Visit to a forage dehydrator (2 hours).

4.- Visit to Semillas Batlle and to an agricultural exploitation - livestock of the Plan of Vencilló (4 hours)

5.- Visit to Pioneer Seeds cornfields (4 hours).

Methodology

Activity	Description	Face to face activity		Autonomous activity		Evaluation	Hours	
		Objectives	Hours	Student work	Hours	Hours	Hours	ECTS
Master class	Master class	Explanation of the main concepts	**48**	Study: Know, understand and synthesize knowledge	**72**	**5**	**125**	**5**
Laboratory and field practices	Participatory class	Application of the theoretical concepts taught in master classes	**14**	Solve problems and cases. Write reports	**16**		**30**	**1,2**
Workshops	Participatory class	Execution of the exercises	**8**	Write reports	**25**		**40**	**1,6**
Visits	Visits to fields, farms and agricultural companies	Application of the theoretical - practical concepts. Knowledge of professional activity	**20**	Write reports	**14**		**30**	**1,2**
Totals			**90**		**125**	**10**	**225**	**9**

This course teaching will be mixed with 50% attendance. Practices, visits and part of the theory will be face to face. The workshops and a part of the theory will be taught with the videoconferencing tool.

Development plan

Activity	Content	Objectives	Hours	
Master class	Topic 1	RA1-RA2	**2**	
Master class	Topic 2	RA1-RA2	**2**	
Master class	Topic 3	RA1-RA2	**4**	
Laboratory and field practices	Practise 1 (1ª parte)	RA1-RA2	**2**	
Master class	Topic 4	RA1-RA2	**4**	
Laboratory and field practices	Practise 2	RA1-RA2	**2**	
Master class	Topic 5	RA1-RA2	**2**	
Laboratory and field practices	Practise 3	RA1-RA2	**2**	
Laboratory and field practices	Practise 4	RA1-RA2	**2**	
Master class	Topic 6	RA1-RA2	**2**	
Laboratory and field practices	Practise 5	RA1-RA2	**2**	
Laboratory and field practices	Practise 1 (2ªparte)	RA1-RA2	2	
Master class	Topic 7	RA2-RA3-RA4	**6**	
Visits	Visit 1	RA3-RA4-RA5	**4**	
Workshosp	Workshosp 1	RA1-RA2	**2**	
Master class	Topic 8	RA2-RA3-RA4	**6**	
Visits	Visit 2	RA3-RA4-RA5	**2**	
Master class	Topic 9	RA2-RA3-RA4	**2**	
Master class	Topic 10	RA2-RA3-RA4	**6**	
Visits	Visit 3	RA3-RA4-RA5	**4**	
Workshosp	Workshosp 2	RA3	**2**	

Master class	Topic 11	RA2-RA3-RA4	**4**	
Master class	Topic 12	RA5	**2**	
Laboratory and field practices	Practise 1 (3ª parte)	RA1-RA2	**2**	
Workshosp	Workshosp 3	RA3-RA4	**2**	
Visits	Visit 4	RA3-RA4-RA5	**4**	
Master class	Topic 13	RA5	**4**	
Master class	Topic 14	RA5	**2**	
Master class	Topic 15	RA5	**2**	
Workshosp	Workshosp 4	RA5	**2**	
Visits	Visit 5	RA3-RA4-RA5	**4**	
Totals			**90**	

Evaluation

Activity	Evaluation	Number	%
Master class	Exams	**2**	**60%**
Laboratory and field practices	Delivery of reports	**5**	**15%**
Technical visit reports	Delivery of reports	**5**	**10%**
Workshosps	Delivery of reports	**4**	**15%**
Total			**100**

Observations
Attendance at all practical laboratory, field sessions, workshops and technical visits is compulsory.
For the purposes of the final grade, to pass the course, students must have obtained a grade equal to or greater than 4 points for the different written exams. The average will have to be equal or superior to 5 points.

Bibliography

Basic

Evans LT. 1980. Crop Physiology. University Press. Cambridge. 374 pp.

Hay RKM., Walker AJ. 1989. An introduction to the physiology of crop yield. Longman

Scientifical and Technical. New York. 292 pp.

Loomis RS., Connor DJ. 1992. Crop Ecology: Productivity and management in Agricultural

Systems. Cambridge Univ. Press. Cambridge. 538 pp.

Metcalfe DS., Elkins DM. 1980. Crop Production: Principles and practices. MacMillan Pub. Co. Inc. New York. 774 pp.

Milthorpe FL., Moorby J. 1982. Introducción a la fisiología de los cultivos. Ed. Hemisferio Sur. Buenos Aires. 259 pp.

Pratley JE. 1988. Principles of field crop production.Sydney University Press. Sydney. 463 pp.

Complementary

ASA. 1991. Alfalfa Management guide. American Society of Agronomy : Crop Science Society of America : Soil Science Society of America.

Duthil J. 1980. Producción de forrajes. Mundi-Prensa. Madrid. 409 pp.

Fitter AH., Hay RKM. 1987. Enviromental Physiology of Plants. Academic Press. Oxford. Hunt R. 1990. Basic growth Analysis. Unwin Hyman. London. 112 pp.

Hall A.E., Canell G.H., Lawton H.W. 1979. Agriculture in Semi-Arid Environments. Spring Verlag. Berlin. 337 pp.

Kirby EJM., Appleyard M. 1981. Cereal development guide. Ceral Unit. England. 82 pp. Muslera E., Ratera C. 1984. Praderas y Forrajes: Producción y aprovechamiento. Mundi-Prensa. Madrid. 702 pp.

Pearson CJ., Ison RL. 1987. Agronomy of grassland systems. University Press. Cambridge.169 pp.

Satorre, E. , Slafer, G.A. 1999. Wheat : Ecology and Physiology of Yield Determination. New York : Food Products Press.

Smith, D. L., Hamel, C. 1999. Crop Yield : Physiology and Processes. Springer.

Smith CW. 1995. Crop Production. Evolution, history and technology. John Wiley and Sons. New York. 469 pp.

Tesar MB. 1984. Physiological basis of Crop Growth and Development. American Society of Agronomy. Madison 341 pp.Tisdale