

Course Unit	Pasture and Forage Crops	Field of study	Animal and Agricultural Productions																
Bachelor in	Agronomic Engineering	School	School of Agriculture																
Academic Year	2022/2023	Year of study	3																
Type	Semestral	Semester	2																
Level	1-3	ECTS credits	5.5																
Code	9086-307-3205-00-22																		
Workload (hours)	148,5	Contact hours	<table border="1"> <tr> <td>T</td><td>30</td> <td>TP</td><td>-</td> <td>PL</td><td>30</td> <td>TC</td><td>-</td> <td>S</td><td>-</td> <td>E</td><td>-</td> <td>OT</td><td>20</td> <td>O</td><td>-</td> </tr> </table>	T	30	TP	-	PL	30	TC	-	S	-	E	-	OT	20	O	-
T	30	TP	-	PL	30	TC	-	S	-	E	-	OT	20	O	-				

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s) Jaime Camilo Afonso Maldonado Pires

### Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:  
Understand the role of pasture and forage crops in the agricultural systems; plan the installation and management of these crops for different animal production systems.

### Prerequisites

Before the course unit the learner is expected to be able to:  
Knowledge in soils, soil fertility, botany, plant physiology, agriculture, and mechanization

### Course contents

The role of pasture and forage crops in agricultural systems; plant physiology, botany and species ecology; establishment and management of pasture and forage crops; forage conservation methods; animal production systems

### Course contents (extended version)

- The role of pasture and forage crops in agricultural systems
  - Overview and concepts
  - History and recent evolution
  - Economic and social importance
  - The pasture and forage crops in Portuguese agriculture
  - The importance of pasture and forage crops to the agroecosystems
  - Main constraints to its production in Portugal
- Basis of forage and pasture production. Morphology and physiology of grasses and legumes
  - Main morphological and physiological aspects
  - Physiology of growth and development
  - Morphological and physiological aspects related with pasture and forage production
- Botany, morphology and ecology of main grassland species
  - Annual rainfed forages
  - Annual irrigated forages
  - Biannual and perennial irrigated forages
  - Irrigated pastures
  - Rainfed pastures
- Pasture and forage crops establishment
  - Soil tillage
  - Sowing of pasture and forage crops, predicted seasonal and annual yields
- Pasture and forage crops management
  - Trends of DM yield and nutritive value (CP, digestibility, energy) along plant development
  - Effect of defoliation and its frequency on regrowth and cumulative yearly yields
  - Optimal cutting dates and grazing
  - Types of grazing
  - Management and grass-legume competition
  - Management of multi-annual pasture and forage crops.
- Meadows (Lameiros)
  - Definition. Main characteristics
  - Types of meadows in relation to floristic composition, utilisation and water availability
  - Crop farming operations traditionally used and its effect on maintenance and yield
  - Meadow maintenance, keeping its vegetation and/or introducing external improved species
- Forage conservation
  - Justification of forage conservation
  - Changes of dry-matter, CP and sugar contents and digestibility values with plant phenology
  - Main forage conservation methods (hay making, ensilage, dehydration)
- Animal production systems
  - Extensive systems based on pasture crops
  - Intensive systems based on conservation of forage crops
  - Main differences between these production systems
  - Concept of yield maximisation by animal and by grassland surface
  - Planning the production and utilisation

### Recommended reading

- Barnes, R. F. ; Miller, D. A. e Nelson, C. J. 2003. Forages. An introduction to grassland agriculture. Blackwell, Ames, 556 pp.
- Moreira, N. 1995. Pastoreio. Interações animal-pastagem e seus reflexos no manejo e na produção. Série Didáctica, nº 44, UTAD, Vila Real, 55 pp
- Moreira, N. 2002. Agronomia das forragens e pastagens. Ed. UTAD, Vila Real, 183 pp
- Pires, J. M. ; Pinto, P. A. & Moreira, N. 1992. Lameiros de Trás-os-Montes. Perspectivas de futuro para estas Pastagens de Montanha. Série Estudos, IPB, 96 pp.
- Trindade, H. 1991. Identificação de espécies pratenses e forrageiras. Série Didáctica - Ciências Aplicadas, nº 20. UTAD, Vila Real, 57 pp.

### Teaching and learning methods

Course contents will be exposed in theoretical classes, except the botany and species ecology that will be studied directly by the students, based on bibliography and FAO databases. All the contents will be complemented with field and laboratory classes, followed by data analysis, bibliographic search, and presentation of reports

**Assessment methods**

- Alternative 1 - (Regular, Student Worker) (Final, Supplementary, Special)
- Practical Work - 40%
- Final Written Exam - 60%

**Language of instruction**

Portuguese

**Electronic validation**

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06-12-2022	12-12-2022	20-12-2022	20-12-2022