

Course guide

390301 - MA - Agricultural Mechanisation

Last modified: 30/05/2022

Unit in charge: Barcelona School of Agri-Food and Biosystems Engineering
Teaching unit: 745 - DEAB - Department of Agri-Food Engineering and Biotechnology.

Degree: BACHELOR'S DEGREE IN AGRICULTURAL ENGINEERING (Syllabus 2009). (Compulsory subject).
BACHELOR'S DEGREE IN AGRONOMIC SCIENCE ENGINEERING (Syllabus 2018). (Compulsory subject).

Academic year: 2022 **ECTS Credits:** 6.0 **Languages:** English

LECTURER

Coordinating lecturer: EMILIO GIL MOYA

Others:

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

1. Engineering of farming exploitations: Agricultural machinery.

Transversal:

2. TEAMWORK - Level 3. Managing and making work groups effective. Resolving possible conflicts, valuing working with others, assessing the effectiveness of a team and presenting the final results.

TEACHING METHODOLOGY

LEARNING OBJECTIVES OF THE SUBJECT

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STUDY LOAD

Type	Hours	Percentage
Hours large group	40,0	26.67
Hours small group	20,0	13.33
Self study	90,0	60.00

Total learning time: 150 h



CONTENTS

(ENG) EL TRACTOR AGRÍCOLA

Description:

Historical evolution and type of tractors. Characteristics of a tractor according to the work to be done. The tractor engine. Power, torque and specific consumption. Transmission and hydraulic equipment of the tractor. Hitch: Specific features. Power take-offs. Four wheel drive. Tool coupling. Traction and taxiing. Tractor tests. The potencies of the tractor. Power tests. Characteristic curves

Related activities:

(ENG) Activitat 1: Classes d'explicació teòrica

Activitat 2: Probes individuals d'avaluació

Activitat 3: Pràctiques de camp/laboratori i resolució de exercicis

Full-or-part-time: 12h

Theory classes: 4h

Self study : 8h

MECHANIZATION OF OPERATIONAL ACTIVITIES IN THE FARM

Description:

Equipment for soil preparation: Objectives of soil work. Primary work tools. Secondary work and preparation of the seed bed. Combination of tools. Techniques of minimum work or simplified work.

- Machinery for the distribution of fertilizers, planting and protection of crops: Type of fertilizers and their main characteristics. Regulation of fertilizers. Semigadoras volumétricas and seeders monograno. Planters. Seed selection and regulation criteria. Machinery for crop protection: General characteristics of dusting. Type of equipment and its relation to crops. Main elements. Criteria for selection and regulation of equipment.

- Forage harvesting machinery: Mowers. Rakes. Packers. Minadoras. Fodder harvesting chains. Type of benefit. Selection and regulation criteria.

- Harvesters: Grain harvesters .. Main elements. Regulations and adjustment. Equipment for harvesting roots and tubers. Other harvesters. Systems of assistance in the manual collection. Vibrators. Harvesters of vegetables. Harvesting.

Related activities:

(ENG) Activitat 1: Classes d'explicació teòrica

Activitat 2: Probes individuals d'avaluació

Activitat 3: Pràctiques de camp/laboratori

Activitat 4: Pràctiques en aula informàtica

Activitat 5: Resolució de exercicis / problemes

Full-or-part-time: 40h

Theory classes: 8h

Laboratory classes: 8h

Self study : 24h



OPERATIONAL COST OF AGRICULTURAL MACHINERY. SELECTION PROCEDURE

Description:

The cost of using agricultural machinery. Fundamental principles. Methodology of calculation. Comparative analysis of methods. Selection of equipment. Fundamental criteria. Methodology for the selection and renovation of the machinery park. New technologies in agricultural mechanization: precision agriculture

Related activities:

(ENG) Activitat 1: Classes d'explicació teòrica
Activitat 2: Proves individuals d'avaluació
Activitat 4: Pràctiques a aula informàtica
Activitat 5: Resolució d'exercicis / problemes

Full-or-part-time: 25h

Theory classes: 6h
Laboratory classes: 4h
Self study : 15h

SPRAY APPLICATION TECHNOLOGY

Description:

European and national regulations on crop protection. Application technologies. Dose expression. Measurement and reduction of drift. Nozzle technology. Precision agriculture in crop protection. Regulation. Inspection of application equipment.

Related activities:

(ENG) Activitat 1: Classes d'explicació teòrica
Activitat 2: Proves individuals d'avaluació

Full-or-part-time: 73h

Theory classes: 22h
Laboratory classes: 8h
Self study : 43h

ACTIVITIES

ACTIVITY 1: LECTURES (THEORETICAL ACTIVITY)

Full-or-part-time: 95h

Theory classes: 38h
Self study: 57h

ACTIVITY 2: PERSONAL TEST FOR EVALUATION

Description:

There will be three parts: the first part of visual recognition of different types of machines; The second part consists of a multiple choice test (V or F); and a third of problem solving. In addition, the evaluation of the course will be completed with the presentation by each of the students (individually or in groups of two) of a topic chosen voluntarily at the beginning of the course (the teacher will provide a list of items) . The work will be presented in writing and made an oral presentation in class during the last week of the course.

Full-or-part-time: 2h

Theory classes: 2h



(ENG) ACTIVITAT 3: PRACTICAL ACTIVITIES IN LABORATORY

Description:

Students will perform several field tests with the equipment available in the laboratory of agricultural mechanization. It is mixed laboratory and field activities in which the student learns to handle, calibrate and evaluate the different teams.

Full-or-part-time: 26h

Laboratory classes: 10h

Self study: 16h

(ENG) ACTIVITAT 4: PRACTICAL ACTIVITIES AT COMPUTER'S LABORATORY

Description:

In these activities the student will be able to work in a variety of cases for the management, selection of agricultural machinery. Examples of costs of utilization costs will be made available, as well as the results of the laboratory tests, and will be used to manage create software programs for a greater management of agricultural machinery.

Full-or-part-time: 21h

Laboratory classes: 8h

Self study: 13h

(ENG) ACTIVITY 5: EXERCICES AND CASE STUDIES

Description:

In small groups students will have to solve problems related to the use and / or selection of agricultural machinery

Full-or-part-time: 6h

Laboratory classes: 2h

Self study: 4h

GRADING SYSTEM

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BIBLIOGRAPHY

Basic:

- Ortiz-Cañavate, Jaime; Hernanz, José Luis. Técnica de la mecanización agraria. 3ª ed., renov. y actualizada. Madrid: Mundi-Prensa, 1989. ISBN 8471142155.
- Cédra, Camille. Les tracteurs agricoles. Paris: Tec & Doc, 1991. ISBN 2852068095.
- Cédra, Camille. Les matériels de travail du sol, semis et plantation. Antony: Cemagref, 1993. ISBN 2853623483.
- Cédra, Camille. Les moissonneuses-batteuses et les équipements pour la récolte des graines. Paris: Cemagref, 1992. ISBN 2853622886.
- Cédra, Camille. Les matériels de récolte des fourrages, ensilage et distribution. Paris: Cemagref, 1995. ISBN 2852068109.
- Pellizzi, Giuseppe. Meccanica e meccanizzazione agricola. Bologna: Agricole, 1987. ISBN 8820627523.
- Arnal Atares, Pedro V.; Laguna Blanca, Antonio. Tractores y motores agrícolas. 3ª ed., rev. y ampliada. Madrid: Mundi Prensa: Ministerio de Agricultura, Pesca y Alimentación., 1996. ISBN 8471146452.
- Ortiz-Cañavate, Jaime; García Ramos, Javier. Las máquinas agrícolas y su aplicación. 6a ed. rev. y ampl. Madrid: Mundi-Prensa, 2003. ISBN 8484761177.