

28913 - Engines and machines

Información del Plan Docente

Academic Year	2016/17
Academic center	201 - Escuela Politécnica Superior
Degree	437 - Degree in Rural and Agri-Food Engineering
ECTS	6.0
Course	2
Period	First semester
Subject Type	Compulsory
Module	---

1. Basic info

1.1. Recommendations to take this course

1.2. Activities and key dates for the course

2. Initiation

2.1. Learning outcomes that define the subject

2.2. Introduction

3. Context and competences

3.1. Goals

3.2. Context and meaning of the subject in the degree

3.3. Competences

3.4. Importance of learning outcomes

4. Evaluation

5. Activities and resources

5.1. General methodological presentation

The learning process designed for this course is based on the following methodologies: Theoretical sessions, Problem-solving Sessions, Practical sessions, Technical visits, and Teamwork.

5.2. Learning activities

The program that the student is offered to achieve the expected results includes the following activities:

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- Theoretical sessions. The teacher explains the theoretical content of each session promoting the participation of the students and the cooperative learning.
- Problem-solving sessions. Students, working individually or in groups, gain knowledge and skills by working to respond problems and questions.
- Practical sessions. Students, working in groups, gain knowledge about the characteristics and regulations of the main agricultural machines. A report of each practical session is required.
- Technical visits. Students visit a manufacturer of agricultural machinery and a fair of agricultural machinery.
- Teamwork. Students, working in groups, develop a specific project which must be exposed orally to the other students.

5.3.Program

Theory

MODULE 0. PRESENTATION OF THE SUBJECT

0.-Introduction, methodology, systems of evaluation

MODULE 1. RECIPROCATING INTERNAL COMBUSTION ENGINES.

1.-Basic concepts of thermodynamics, static and dynamic.

2.-Real cycles of power.

3.-Reciprocating internal combustion engines.

4.-Performance and characteristic curves of the engine.

MODULE 2. TRACTORS

5.-Tractor transmission.

6.-Hydraulic equipment of the tractor. Couplings.

7.-Balance of the tractor. Steering, brakes and tyres. Rolling and skidding.

MODULE 3. WORKING THE LAND

8.-Equipment for preparatory and primary work and for follow-up.

MODULE 4. THE DISTRIBUTION OF PRODUCTS

9.-Machinery for the application of fertilizers.

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10.-Machinery for sowing, planting and transplanting.

11.-Machinery for protecting crops.

MODULE 5. GATHERING THE HARVEST

12.-Machinery for gathering forage and machinery for gardening.

13.- Machinery for the harvesting of cereals and fruit.

MODULE 6. SELECTION, COSTS AND MANAGEMENT OF THE MACHINERY

14.- The cost of using farm machinery. Work capacity of farm machinery.

MODULE 7. NEW TECHNOLOGIES IN FARM MACHINERY .

15.- New technologies in farm machinery.

Practicals

Laboratory Practicals

PRACTICAL 1. THE FARM TRACTOR. (lessons 3 to 7)

- a) Constituent parts.
- b) Engines.
- c) Equipment coupling systems.

PRACTICAL 2. THE RECIPROCATING INTERNAL COMBUSTION ENGINE (lessons 3 to 7)

- a) Constituent parts.
- b) Technical characteristics

PRACTICAL 3. THE TRANSMISSION SYSTEM. (lessons 3 to 7)

- a) Types of transmissions.
- b) Graph of speed of displacement - engine speed.

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7 hours										3		all
15th week	2	3								3		15
8 hours												
TOTAL HOURS											4	
150 hours	30	48	14	15	8	4	8	0		19		
ECTS	1.2	1.92	0.56	0.60	0.32	0.16	0.32		0.0	0.76	0.16	

FF h : hours of face to face sessions.

IW h: hours of individual work.

5.5.Bibliography and recommended resources

BB-Basic bibliography

- BB Arnal Atarés, Pedro V.. Tractores y motores agrícolas / por Pedro V. Arnal Atarés , Antonio Laguna Blanca . - 3a. ed., rev. y amp., reimpr. Madrid : Ministerio de Agricultura, Pesca y Alimentación, Secretaría General Técnica : Mundi-Prensa, 2005
- BB Laguna Blanca, Antonio. Maquinaria agrícola : constitución, funcionamiento, regulaciones y cuidados / por Antonio Laguna Blanca . - 3ª ed. Madrid : Ministerio de Agricultura, Pesca y Alimentación, Secretaría General Técnica, 1999
- BB Ortiz-Cañavate, Jaime. Las maquinas agrícolas y su aplicación / por Jaime Ortiz- Cañavate ; con la colaboración de Javier García Ramos ... [et al.] . - 6a. ed. rev. y amp. Madrid [etc.] : Mundi-Prensa, 2003
- BB Ortiz-Cañavate, Jaime. Tractores : técnica y seguridad / Jaime Ortiz-Cañavate ; con la colaboración de: Jacinto Gil Sierra...[et al.] Madrid [etc.] : Mundi-Prensa, 2005
- BB Segura Clavell, José. Termodinámica técnica / Jose Segura Clavell Barcelona [etc.] : Reverté, D.L.1990