



Year : 2018/19

28913 - Engines and machines

Syllabus Information

Academic Year:	2018/19
Subject:	28913 - Engines and machines
Faculty / School:	201 -
Degree:	437 - Degree in Rural and Agri-Food Engineering
ECTS:	6.0
Year:	2
Semester:	First semester
Subject Type:	Compulsory
Module:	---

General information

Aims of the course

Context and importance of this course in the degree

Recommendations to take this course

Learning goals

Competences

Learning goals

Importance of learning goals

Assessment (1st and 2nd call)

Assessment tasks (description of tasks, marking system and assessment criteria)

Methodology, learning tasks, syllabus and resources

Methodological overview

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

Learning tasks

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

- 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.

Syllabus

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.

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.

PRACTICAL 4. SPRAY NOZZLES. (lesson 10)

- a) Types of nozzle.

Problemas	2	2		2					2	2		2		2	2			16	
Prácticas laboratorio					2	2	2				2							8	
Trabajos en grupo																		0	
Salidas 3 de prácticas										3				2				8	
Tutorías ECTS																		0	
Evaluación Actividad No presencial																	3	0	
Trabajo individual:	4	6	4	4	4	4	4	4	1	1	1	4	4	7	5	6	5	76	
Trabajo en grupo									3	3	2	2	2		2			14	
TOTAL	9	6	10	8	6	8	8	6	8	8	8	10	10	6	7	13	8	5	150

Bibliography and recommended resources

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

BC Bell, Brian. (2016). Farm machinery. Old Pond, 6a. ed. [english friendly]

BC Goering, Carroll E., Hansen, Alan C. (2004). Engine and tractor power. American Society of Agricultural Engineers, 4a. ed. [english friendly]

The updated recommended bibliography can be consulted in:
<http://psfunizar7.unizar.es/br13/egAsignaturas.php?id=8074>