390411 - MHEV - Horticultural and Green Space Mechanisation

Coordinating unit: 390 - ESAB - Barcelona School of Agricultural Engineering
Teaching unit: 745 - EAB - Department of Agri-Food Engineering and Biotechnology
Academic year: 2017
Degree: BACHELOR'S DEGREE IN AGRICULTURAL, ENVIRONMENTAL AND LANDSCAPE ENGINEERING (Syllabus 2009). (Teaching unit Compulsory)
ECTS credits: 6
Teaching languages: English

Teaching staff
Coordinator: EMILIO GIL MOYA

Degree competences to which the subject contributes

Specific:
1. Engineering of gardens, parks, sport zones and horticultural exploitation: Horticultural and gardening 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
Theoretical classes in the form of participatory master classes with important interaction between teacher and student and between students.

Sessions of work in classroom: practical instrumental development of the concepts of theory through exercises of increasing difficulty during the development of the program. Reading and discussion of technical texts and presentation of problems and / or real situations proposed by students. This type of activities will always be developed in a group to promote teamwork and multidisciplinarity.

Lab sessions and field sessions, to which the student will have the opportunity to check, analyze and evaluate the Behavior of the teams, applying the knowledge acquired to the theory sessions and in the problem sessions.

Learning objectives of the subject
It is intended that the student, upon successful completion of the subject, be able to know the basic fundamentals of mechanization in horticultural and fruit production, establish criteria for the analysis of the operation of different equipment, select them appropriately, according to technical criteria, Economic and environmental, the appropriate equipment for each particular case. Calculate, evaluate and analyze the cost of use of agricultural machines and solve global problems of selection and use of equipment. Select, use and evaluate the equipment necessary for the mechanization of green spaces and adapt the use of the equipment to the specific social and environmental requirements of the gardening sector and green spaces.
## Study load

<table>
<thead>
<tr>
<th></th>
<th>Hours large group:</th>
<th>%</th>
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<tbody>
<tr>
<td>Total learning time:</td>
<td>150h</td>
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<tr>
<td>Hours medium group:</td>
<td>40h</td>
<td>26.67%</td>
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<tr>
<td>Hours small group:</td>
<td>20h</td>
<td>13.33%</td>
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<tr>
<td>Guided activities:</td>
<td>0h</td>
<td>0.00%</td>
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<tr>
<td>Self study:</td>
<td>90h</td>
<td>60.00%</td>
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### Content

**AGRICULTURAL TRACTORS**

<table>
<thead>
<tr>
<th>Learning time: 12h</th>
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<tbody>
<tr>
<td>Theory classes: 4h</td>
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<tr>
<td>Self study : 8h</td>
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**Description:**

**Related activities:**
- Activity 1: Theoretical explanations
- Activity 2: Individual evaluation tests
- Activity 3: Pratical activity: laboratory, computers and field practices

**OPERATIONAL LABOR AT FARM. ASSOCIATED FARM MACHINERY**

<table>
<thead>
<tr>
<th>Learning time: 40h</th>
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<tbody>
<tr>
<td>Theory classes: 8h</td>
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<tr>
<td>Laboratory classes: 8h</td>
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<tr>
<td>Self study : 24h</td>
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**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.


Mechanization of green spaces. Singularities. Management of parks of machinery by gardening

**Related activities:**
- Activity 1: Classes of theoretical explanation
- Activity 2: Individual assessment tests
- Activity 3: Field / Laboratory Practices
- Activity 4: Practices in Computer Classroom
- Activity 5: Case studies / Exercicies
### AGRICULTURAL MACHINERY OPERATIONAL COSTS. SELECTION PROCEDURE

**Description:**

**Related activities:**
- Activity 1: Classes of theoretical explanation
- Activity 2: Individual assessment tests
- Activity 4: Practices in Computer Classroom
- Activity 5: Exercise / problem resolution

**Learning time:** 25h
- Theory classes: 6h
- Laboratory classes: 4h
- Self study: 15h

### SPRAYING TECHNOLOGY FOR CROP PROTECTION

**Description:**

**Related activities:**
- Activity 1: Classes of theoretical explanation
- Activity 2: Individual assessment tests
- Activity 3: Field / Laboratory Practices
- Activity 4: Practices in Computer Classroom

**Learning time:** 73h
- Theory classes: 22h
- Laboratory classes: 8h
- Self study: 43h
### Planning of activities

<table>
<thead>
<tr>
<th>ACTIVITY 1: THEORETICAL LECTURES</th>
<th>Hours: 95h</th>
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<tbody>
<tr>
<td></td>
<td>Theory classes: 38h</td>
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<tr>
<td></td>
<td>Self study: 57h</td>
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</tbody>
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<table>
<thead>
<tr>
<th>ACTIVITY 2: INDIVIDUAL EVALUATION TESTS</th>
<th>Hours: 2h</th>
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<tbody>
<tr>
<td></td>
<td>Theory classes: 2h</td>
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**Description:**
Three parts will be organized: a first part of visual reconeixement of diferents tipus of machines; A second part consistent in a test tip test (V or F); I a third part of problem solving. At the end of the course the student will complete a presentation of each subject (individually or in groups of two) of a subject selected voluntarily at the beginning of the course (the teacher will offer a list of subjects) . The treball is to present a periport to perform an oral presentation to the class during the last session of the course.

<table>
<thead>
<tr>
<th>ACTIVITY 3: PRACTICAL ACTIVITIES / LABORATORY AND FIELD TRIALS</th>
<th>Hours: 26h</th>
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<tbody>
<tr>
<td></td>
<td>Laboratory classes: 10h</td>
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<td>Self study: 16h</td>
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**Description:**
Different field tests will be carried out with the equipment available in the agricultural mechanization laboratory. These are mixed laboratory and field activities in which the student learns how to handle, calibrate and evaluate different equipment.

<table>
<thead>
<tr>
<th>ACTIVITY 4: PRACTICAL LECTURES IN COMPUTERS' ROOM</th>
<th>Hours: 21h</th>
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<tr>
<td></td>
<td>Laboratory classes: 8h</td>
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<td>Self study: 13h</td>
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**Description:**
In these activities the student will be able to work in a variety of eines 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 creatine software programs for a greater management of agricultural machinery.

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<tr>
<th>ACTIVITY 5: CASE STUDIES AND EXERCISES</th>
<th>Hours: 6h</th>
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<tr>
<td></td>
<td>Laboratory classes: 2h</td>
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<td>Self study: 4h</td>
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**Description:**
Organized in small groups the students will work with different case studies related with agricultural machinery.
Qualification system

N1: Theory (40%): Evaluation activity 2. Two exams will be done, one half and the other at the end of the semester. Each exam will be worth 50% of the theory grade.

N2: Presentation in the classroom (10%): The quality of the document presented by the student, as well as the quality of the oral presentation will be evaluated.

N3: Problem solving (10%): Evaluation of activities 4 and 5. The documents presented by the student will be evaluated at the conclusion of the problem sessions.

CG: Practices (40%): Assessment activity 3. Attitude and aptitude will be assessed during the development of the practices, as well as the report prepared at the end of each working session. It will evaluate the dynamization of working groups, resolving potential conflicts, assessing the work done with other people and evaluating the effectiveness of the team.

Evaluation formula:

N_{final} = 0.4N1 + 0.1N2 + 0.1N3 + 0.4CG

Bibliography