Course Specifications
Valid as from the academic year 2014-2015

Livestock Housing and Agricultural Machinery (L700026)

Course size (nominal values; actual values may depend on programme)

<table>
<thead>
<tr>
<th>Credits</th>
<th>Study time</th>
<th>Contact hrs</th>
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<tr>
<td>8.0</td>
<td>240 h</td>
<td>84.0 h</td>
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Course offerings and teaching methods in academic year 2019-2020

A (semester 2) Dutch
fieldwork 20.0 h
lecture 48.0 h
excursion 4.0 h
self-reliant study activities 12.0 h

Lecturers in academic year 2019-2020
Sonck, Bart LA22 lecturer-in-charge

Offered in the following programmes in 2019-2020

| Bachelor of Science in Bioscience Engineering Technology | 8 | A |
| Linking Course Master of Science in Bioscience Engineering Technology: Agriculture and Horticulture (main subject Plant and Animal Production) | 8 | A |
| Linking Course Master of Science in Bioscience Engineering Technology: Agriculture and Horticulture (main subject Tropical Plant Production) | 8 | A |
| Preparatory Course Master of Science in Bioscience Engineering Technology: Agriculture and Horticulture (main subject Plant and Animal Production) | 8 | A |
| Preparatory Course Master of Science in Bioscience Engineering Technology: Agriculture and Horticulture (main subject Tropical Plant Production) | 8 | A |

Teaching languages
Dutch

Keywords
Agricultural machinery, agricultural mechanisation, agricultural mechanics, climate control, ventilation, construction of animal houses, welfare of farm animals.

Position of the course
This course must provide students with a general insight in applying engineering in agriculture and horticulture. Besides the construction of a number of specific agricultural machines the students become familiar with the main working principles as applied to agricultural machinery whereby they obtain a basis to understand the working of other agricultural machinery (not included in the course). In addition, they will learn to apply thermodynamics in climate control of natural and mechanically ventilated animal houses in order to create and maintain an optimal climate for farm animals. They will learn more about the construction and equipment of houses for cattle, pigs and poultry, with a focus on animal welfare, environmental protection and sustainable materials.

Contents
The course has two main parts. The first part deals in detail with the principles and operation of natural and mechanically ventilated animal houses. The course treats the calculation method, the practical execution and adjustment of the ventilation. Farm animal houses for cattle, pigs and poultry are discussed in detail, with a focus on animal welfare and environmental aspects. The second part gives a detailed description of the operation and construction of the major agricultural machines. The

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following agricultural machines are discussed: ploughs, soil cultivation implements, sowing machines, fertiliser spreaders and spraying equipment. During the practical exercises the operation and adjustment of these machines is discussed.

Initial competences

Students became the final competences of fysics I, II, III and engineering sciences. Students must have a basic knowledge of agricultural machinery (must have seen e.g. plough, sowing machines, sprayers, fertiliser spreaders), machinery construction (insight in the construction of a machine), animal houses: poultry, pigs, cattle (must have visited some animal houses).

Final competences

- students must acquire an insight in the construction of the plough, soil cultivation machines, sowing machines, spraying equipment and fertiliser spreaders
- students must have a practical and theoretical knowledge of the adjustment of the machinery.
- students must have a theoretical knowledge of the operation of natural and mechanically ventilated animal houses
- students must be able to recognize ventilation problems in an animal house, to analyze ventilation problems and suggest practical solutions based on their theoretical knowledge (calculation)
- students must acquire a basic knowledge of housing systems for farm animals, in particular the housing of cattle, pigs and poultry (incl. reduction of NH3 emission in animal houses)
- students must acquire a knowledge to improve the welfare of farm animals in the animal houses

Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Demonstration, excursion, lecture, fieldwork, self-reliant study activities

Extra information on the teaching methods

- lectures with illustrations (PowerPoint presentations) and videos
- practical lessons: PCLT Roeselare, ILVO Merelbeke, visits to commercial farms and enterprises dealing agricultural machines (e.g. CNH, Zedelgem).

Learning materials and price

The syllabus contains a first part with the following chapters: Climate control in animal houses, construction and equipment of animal house for cattle, pigs and poultry. The second part contains five chapters viz. the plough, soil cultivation machinery, sowing machines, fertiliser spreaders, spraying equipment. Syllabus Agrosystems engineering: approx. 250 pp. (incl. figures and photographs).

References

Course content-related study coaching

- follow-up through calculation exercises
- follow-up through practical exercises: PCLT Roeselare, ILVO Merelbeke, visits to commercial farms and enterprises dealing agricultural machines.
- follow-up through interaction with students
- group task: solving a ventilation problem on a commercial farm
- group task: scientific experimental design related to research on animal housing

Evaluation methods

End-of-term evaluation and continuous assessment

Examination methods in case of periodic evaluation during the first examination period

Oral examination

Examination methods in case of periodic evaluation during the second examination period

Oral examination

Examination methods in case of permanent evaluation

Report

Possibilities of retake in case of permanent evaluation

examination during the second examination period is not possible

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Extra information on the examination methods
- Oral examination with written preparation
- Assessment of reports on visits and exercises.

Calculation of the examination mark
- Theory: 4/5
- Practical exercises: 1/5