Course Specifications
Valid as from the academic year 2016-2017

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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<tbody>
<tr>
<td>5.0</td>
<td>135 h</td>
<td>60.0 h</td>
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Course offerings and teaching methods in academic year 2018-2019

<table>
<thead>
<tr>
<th>A (semester 1)</th>
<th>English</th>
<th>excursion: 13.75 h</th>
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<tr>
<td></td>
<td></td>
<td>guided self-study: 12.5 h</td>
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<td></td>
<td></td>
<td>practicum: 2.5 h</td>
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<td></td>
<td></td>
<td>seminar: coached exercises: 7.5 h</td>
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<td></td>
<td></td>
<td>lecture: 23.75 h</td>
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Lecturers in academic year 2018-2019

<table>
<thead>
<tr>
<th>Reheul, Dirk</th>
<th>LA21</th>
<th>lecturer-in-charge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cougnon, Mathias</td>
<td>LA21</td>
<td>co-lecturer</td>
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Offered in the following programmes in 2018-2019

| Master of Science in Nutrition and Rural Development (main subject Tropical Agriculture) | 5 | A |
| Master of Science in Bioscience Engineering: Cell and Gene Biotechnology | 5 | A |
| Master of Science in Bioscience Engineering: Agricultural Sciences | 5 | A |
| Exchange Programme in Bioscience Engineering: Agricultural Sciences (master's level) | 5 | A |
| Exchange Programme in Bioscience Engineering: Cell and Gene Biotechnology (master's level) | 5 | A |

Teaching languages

- English

Keywords

- Variety breeding, selection systems, reproduction systems, back-crossing, hybrid breeding, synthetic varieties, open pollinated and self pollinated crops, resistance breeding, ploidy breeding, plant breeders’ rights, genetic variation

Position of the course

- Plant breeding is an outmost important science to develop a sustainable crop and food production. Hence there is a need to teach students strategies, methods and tools used to create and to protect modern plant varieties.

Contents

1. Introduction: historical evolution, (social) impact of plant breeding and recent developments
2. Opportunities and restrictions of plant breeding
3. Selection for several traits simultaneously
4. Flower biology and reproduction systems
5. Backcrosses and marker assisted backcrossing
6. Hybrid breeding
7. Suicide seeds
8. Open pollinated populations and synthetic varieties
9. Breeding self pollinating crops
10. Ploidy breeding
11. Resistance breeding
12. How to use genetic variability?
13. Plant breeders’ rights

(Approved)
14. Visits to research institutes and/or plant breeding companies

Initial competences
  
  Good knowledge of botany, plant physiology, crop husbandry, applied genetics and statistics

Final competences

1. Students **understand** plant reproductive systems, modern breeding programmes, strategies, methods, techniques and schemes.
2. Students **know** the potential and constraints of plant breeding.
3. Students **know** how modern varieties are created.
4. Students **know** why and how plant varieties are protected and how plant breeding companies are organized.
5. Students **are aware of** historical evolutions in plant breeding and **are aware of** innovations and new developments.
6. Students **can** analyze and interpret literature regarding plant breeding.
7. Students **can** assess and reflect critically upon recent developments.
8. Students **can** take up a job as junior breeder in a plant breeding company or plant breeding institute or become an independent plant breeder.

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

Guided self-study, excursion, lecture, practicum, seminar: coached exercises

Learning materials and price

Syllabus available
Cost: 20.0 EUR.

References

Remarkable and/or very informative journal articles and books, research results.

Course content-related study coaching

The knowledge transfer is based on a no-nonsense long standing experience in plant breeding and variety development

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

Participation, assignment, report

Possibilities of retake in case of permanent evaluation

examination during the second examination period is not possible

Extra information on the examination methods

Participation to activities with a permanent evaluation is compulsory. Students with an insufficient dedication regarding these activities and with an unmotivated absence in the excursions can not earn credits for this course.

Calculation of the examination mark

The oral exam is the final assessment. Participation to activities with a permanent evaluation is compulsory. Students with an insufficient dedication regarding these activities and with an unmotivated absence in the excursions can not earn credits for this course.