

# Génétique des populations et amélioration des plantes

## Lecturers

Olivier HARDY (Coordinator), Christian HERMANS and Marjolein VISSER

## Course mnemonic

BING-F4006

## ECTS credits

5 credits

## Language(s) of instruction

French

## Course period

Second term

## Course content

Molecular markers used in population genetics. Evolutionary forces determining genetic variation in populations (genetic drift, mutation, migration, selection). Principles of quantitative genetics. Conservation of genetic resources. Introduction to plant breeding. Selection scheme according to reproductive systems (autogamy, allogamy, clonality). Introduction to biotechnological approaches for plant breeding (nutrient and water use efficiency, nutritional quality,...).

## Objectives (and/or specific learning outcomes)

After this course, the student is expected to be able to (i) understand the main mechanisms controlling the genetic variation in natural or cultivated populations, (ii) apply molecular genetics tools to study organism evolution (at intraspecific level), biodiversity conservation and plant breeding, (iii) solve concrete population genetic and quantitative genetic problems, (iv) conceive a plant breeding strategy using selection schemes and biotechnologies according to environmental, agronomic and socio-economic constraints.

## Teaching method and learning activities

Magisterial courses for theory. Exercises to learn solving basic problems of population genetics and quantitative genetics. An excursion related to plant breeding (e.g. in a seed production company) and seminars will complete the formation.

## Contribution to the teaching profile

Management of natural genetic resources to conciliate conservation and production. To acquire knowledge regarding to the genetic mechanisms affecting the evolution of populations and the way to control them for improving plant production.

## References, bibliography and recommended reading

For plant breeding:

Breeding Field Crops, 5th Edition (2006). David Allen Sleper, John Milton Poehlman. ISBN: 978-0-8138-2428-4

Organic crop breeding, 1th Edition (2012). Edith Lammerts van Bueren, James R. Myers.

For population genetics:

Génétique des populations: cours et exercices corrigés. Jean-Louis Serre (Éditeur : Dunod, 2006). ISBN: 2100496204, 9782100496204

## Other information

### Contact(s)

Olivier Hardy (CP160/12, Solbosch, office Uc4.250, tel: 6585; ohardy@ulb.ac.be), Marjolein Visser (CP264/2, Plaine, building NO, office O206, tel: 2133, Marjolein.Visser@ulb.ac.be), Christian Hermans (CP242, Plaine, duiling BC, office 1C6-207, tel: 5417; Christian.Hermans@ulb.ac.be)

## Evaluation method(s)

Other

### Evaluation method(s) (additional information)

Written exam: open questions on lectures and exercises to solve (lecture notes can be perused only for exercises). A transversal question will be orally answered. For the population genetics part (10 points over 20), partial evaluations during the year using multiple choice questions (MCQs, non compulsory) can be taken into account (max 50% of the note), considering only MCQs with a note higher than the one of the written exam regarding the population genetics part.

### Determination of the mark (including the weighting of partial marks)

Written + oral exam (75% to 100%), MCQs on population genetics (0% to 25%).

## Main language(s) of evaluation

French

## Programmes

### Programmes proposing this course at the faculty of Sciences

MA-AGEC | **Master in Agroecology** | finalité Professional/unit 1  
and MA-IRBA | **Master in Agricultural Bioengineering** | finalité Professional/unit 1

### Programmes proposing this course at the Brussels School of Engineering

MA-IRBA | **Master in Agricultural Bioengineering** | finalité Professional/unit 1

