Course Specifications
Valid as from the academic year 2019-2020

Course

Credits 5.0
Study time 150 h
Contact hrs 48.0 h

Course offerings and teaching methods in academic year 2019-2020
A (semester 1) Dutch
- lecture 24.0 h
- seminar: coached exercises 12.0 h
- self-reliant study activities 12.0 h

Lecturers in academic year 2019-2020
Audenaert, Kris LA21 lecturer-in-charge

Offered in the following programmes in 2019-2020
Bachelor of Science in Bioscience Engineering Technology 5 A

Teaching languages
Dutch

Keywords
Genetics - heredity - population genetics - quantitative genetics - molecular genetics - gene regulation

Position of the course
Expression of genes are the basis of physiological processes in plants, animals and humans. A detailed insight into gene functioning and structure of the genetic material (DNA, RNA,...) are essential for plant- and animal breeding, molecular detection techniques, nutrition and other fields

Contents
- heredity and Mendel's laws (genotype and phenotype, meiosis, mitosis, and genetic implications)
- sex-linked heredity (sex chromosomes, X and Y linked heredity, sex determination)
- Interactions between genes, exceptions on Mendel's laws (absence of dominance, multiple alleles, complementary genes, epistasis, suppressor genes, modifiers, penetrance, expression, imprinting)
- Gene linkage (interchromosomal variation, crossing over, gene maps)
- Chemical structure and organisation of the genetic material (DNA, RNA, DNA replication, organisation of chromosomes)
- Expression of genes (genetic code, protein synthesis, regulation of gene expression)
- Cytological and non-cytological changes in the genome (deviant number of chromosomes, deletions, deficiencies, inversions, duplication, translocation and mutations)
- Quantitative genetics (genotypes versus ecosystem variances, heritability and genetic progress)
- Population genetics (gene- and allele frequencies, Hardy Weinberg, inbred, and genetic drift)

Initial competences
End competences of "anatomy and morphology of higher plants", "plant physiology", "general zoology" and "structure and physiology of animals" have to be acquired. Knowledge of basic principles of statistics and bio molecules is advisable

Final competences
1 Link up physiological processes and gene expression
2 Estimate the effect of hereditary mechanisms and apply in plant- and animal
populations.
3 Acquire basic knowledge to understand molecular detection principles
4 Solve genetic problems based on insights into heredity mechanisms
5 Use probability to calculate heritability and patterns in transmission genetics

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
Lecture, self-reliant study activities, seminar: coached exercises

Learning materials and price
Syllabus for theory and exercises are available
Reference material (books, specialized web sites)

References
Course content-related study coaching
Permanent occasion for questioning
Permanent evaluation during exercises
All exercises are available via MINERVA/CHAMILO

Evaluation methods
end-of-term evaluation

Examination methods in case of periodic evaluation during the first examination period
Written examination with open questions, written examination with multiple choice questions

Examination methods in case of periodic evaluation during the second examination period
Written examination with open questions, written examination with multiple choice questions

Examination methods in case of permanent evaluation
Job performance assessment

Possibilities of retake in case of permanent evaluation
not applicable

Extra information on the examination methods
• Theory: written exams: multiple choice, interpretation of figures, open questions, genetic problems (1st and 2nd examination period)

Calculation of the examination mark
• PE: 90%
• NPE: 10%

De student has to participate in all exams to allow him/her to pass. The NPE reflects the active participation of the student during the practical exercises.

(Approved)