

## Developmental Biology (C003183)

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

Credits 5.0 Study time 125 h Contact hrs 45.0 h

Course offerings and teaching methods in academic year 2018-2019

A (semester 1)	Dutch	lecture	25.0 h
		practicum	20.0 h

Lecturers in academic year 2018-2019

Beeckman, Tom	WE09	lecturer-in-charge
Huyseune, Ann	WE11	co-lecturer

Offered in the following programmes in 2018-2019

	crdts	offering
<a href="#">Bachelor of Science in Biology</a>	5	A
<a href="#">Preparatory Course Master of Science in Biology</a>	5	A

Teaching languages

Dutch

Keywords

Development, morphogenesis, differentiation, inductions, invertebrates, vertebrates, plants

Position of the course

The aims are twofold:

- (1) to provide basic knowledge in the process of development of multicellular organisms;
- (2) to provide insights so that the student is capable of problem-solving thinking, and of screening and critically evaluating relevant literature.

Contents

Partim animal developmental biology:

- Introduction
- Cell-cell communication in development
- Gametogenesis & fertilization
- Transition to multicellularity: cleavage
- Reorganization of the embryonic cells: gastrulation
- Early embryonic development in selected invertebrates
  - Early development in sea urchins, molluscs & tunicates
  - Early development in *C. elegans*
  - Early development in *Drosophila*
- Early embryonic development in selected vertebrates
  - Early development in amphibians
  - Early development in teleosts
  - Early development in birds
  - Early development in mammals
- Late embryonic development & organogenesis, further development of the germ layers:
  - Ectoderm and the neural crest as 'fourth germ layer'
  - Mesoderm
  - Endoderm
- Regulation of development by environmental factors

Partim plant developmental biology:

- Introduction

- Evolutionary aspects of plant development
- Introduction to different plant model systems
- Introduction to the molecular study of development
- Embryonic development
  - Pattern formation
  - Cell-cell communication
  - Ontogeny of the embryonic root
- Primary vegetative development
  - The stem meristem
  - Phyllotaxis
- Reproductive development
  - Induction of flowering
  - Flower development

#### Initial competences

Successfully having followed the courses Cell biology and Genetics, Molecular Genetics I, Biodiversity of Plants, Biodiversity of Invertebrates, Biodiversity of Vertebrates, Vertebrates: histology and comparative anatomy, Plant physiology, or having acquired the competences otherwise.

#### Final competences

- 1 Through the acquisition of basic knowledge, provided during this course,
- 2 and through the way in which the course is taught,
- 3 the student should have improved his/her critical thinking,
- 4 should now be able to critically analyse and evaluate relevant literature,
- 5 and be more familiar with problem-solving thinking.

#### 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, practicum

#### Extra information on the teaching methods

Theory: oral classes, use of multimedia

Exercises: hands-on study of the embryonic development of a few selected model organisms

#### Learning materials and price

Syllabus & slides: available via Minerva

Handbook: Gilbert, SF & Barresi MJF (2016) Developmental Biology, 11th ed. Sinauer Associates.

#### References

#### Course content-related study coaching

Possibility for questions and discussions during or after classes and practica, or after appointment by email.

#### 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

#### Possibilities of retake in case of permanent evaluation

examination during the second examination period is not possible

#### Extra information on the examination methods

The oral examination is with a written preparation.

Permanent evaluation based on participation in classes and practical exercises.

## Calculation of the examination mark

The permanent evaluation counts for 1/5 of the total mark.