

Course Specifications

Valid as from the academic year 2020-2021

Model Organisms (C003332)

Due to Covid 19, the education and evaluation methods may vary from the information displayed in the schedules and course details. Any changes will be communicated on Ufora.

Course size (nominal values; actual values may depend on programme)
Credits 3.0 Study time 90 h Contact hrs 52.5 h

Course offerings and teaching methods in academic year 2020-2021

A (semester 2)	English	Gent	practicum	25.0 h
			excursion	8.75 h
			lecture	12.5 h

Lecturers in academic year 2020-2021

Braeckman, Bart	WE11	lecturer-in-charge
Huyseune, Ann	WE11	co-lecturer
van Hengel, Jolanda	GE05	co-lecturer

Offered in the following programmes in 2020-2021

	crdts	offering
Master of Science in Teaching in Science and Technology (main subject Biology)	3	A
Master of Science in Biology	3	A
Exchange Programme in Biology (master's level)	3	A

Teaching languages

English

Keywords

Model systems

Position of the course

Complexity, genetic variability as well as ethical restraints are inherent to research on humans, making the use of model organisms inevitable in fundamental and applied research. Crucial to this approach is the presumption that fundamental biological processes are very similar among species and that detailed study of one species will give valuable information on the biology of (distantly) related species. In this course, an overview of the most popular model species will be provided, together with their history and biology. We will emphasize the contribution of each model to biology.

When it comes to mimicking disease animal models are sometimes inadequate. New technologies—3D cell culturing, induced pluripotent stem cells, gene editing and organ on a chip—are leading to solutions for replacing, refining, and reducing animal models. The goal is to provide the students with an introduction to those concepts.

Contents

Introduction: model organisms

Microorganisms

- *Escherichia coli*
- *Saccharomyces cerevisiae*

Invertebrates

- *Caenorhabditis elegans*
- *Drosophila melanogaster*

Vertebrates

- *Danio rerio*
- *Mus musculus*
- other vertebrate model organisms

Practicals

During the practical sessions, the students will be introduced to a number of model species and will be given the opportunity to conduct a few experiments.

The practicals also include excursions to laboratoria in which vertebrate models are

used.

The content of the practicals can be modified due to corona measures.

Initial competences

The student has successfully completed the courses cell biology, biochemistry, genetics, developmental biology, plant physiology and animal physiology.

Final competences

- 1 Understanding the importance of model organisms in the unraveling of biological processes.
- 2 Being able to understand and describe the biology of the most common model organisms.
- 3 Knowing the available molecular toolbox of model organisms and understanding how this toolbox is used to solve complex biological questions.
- 4 Develop experimental competences using several model organisms.

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

Excursion, lecture, practicum

Learning materials and price

Syllabus is available

Introduction, unicellular and invertebrate organisms: Academia Press - estimated cost: 15 EUR

Vertebrate models: available via Ufora

References

Course content-related study coaching

Questions can be asked during the lectures, practicals or via the Ufora forum.

Evaluation methods

end-of-term evaluation and continuous assessment

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

Written examination with open questions, oral examination

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

Written examination with open questions, oral examination

Examination methods in case of permanent evaluation

Job performance assessment, report

Possibilities of retake in case of permanent evaluation

examination during the second examination period is not possible

Extra information on the examination methods

In case of retake, the results of the non-periodical evaluation of the first exam period will be transferred to the second exam period.

Due to corona measures it is possible that the exam will be written only.

Calculation of the examination mark

65% periodical evaluation + 35% non-periodical evaluation

In case the practicals are reduced due to corona measures, the proportion of non-period bound evaluation will be reduced as well. The percentage will be announced on the Ufora platform.