

Introduction to Biomimicry (C004103)

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 37.5 h

Course offerings and teaching methods in academic year 2020-2021

A (semester 1)	English	Gent	teaching methods	hours
			guided self-study	6.25 h
			project	5.0 h
			online lecture	15.0 h
			online group work	6.25 h
			online seminar:	5.0 h
			coached exercises	

Lecturers in academic year 2020-2021

D'Alba Altamirano, Liliana	WE11	lecturer-in-charge
Shawkey, Matthew	WE11	co-lecturer

Offered in the following programmes in 2020-2021

programme	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

Biomimicry, bio-inspiration, sustainable design, creativity.

Position of the course

This course is an optional course in the master Biology (both within the minor program 'Bio-inspired Innovation and Sustainability' and minor program 'Research'). Students will learn essential concepts of biomimicry and experience opportunities to link those concepts to their own area of interest and expertise. The lectures focus on the process of learning about and from nature in order to transfer that knowledge and propose innovative solutions to human-related problems. Knowledge obtained in the course can be used as a framework for students interested in adopting sustainable design approaches in their own fields. Biomimicry is deeply embedded in nature and based in the study of dynamic, living systems. Hence, this course combines lessons in the basics of ecology and biology while encouraging productive dialogue, creativity and solution based thinking.

Contents

The course comprises (1) Lectures to deliver the course's theoretical content, (2) Class discussions and practical sessions to conduct exercises that apply the concepts learned in the lectures. (3) Three guest lectures by people from the professional field, (4) Final assignment presentation by students.

Initial competences

No specific competences are required.

Final competences

- 1 Understand the theory behind biomimicry and provide examples of biomimetic applications.
- 2 Recognize the necessity and importance of observing and consulting nature to propose solutions to human-related challenges.

- 3 Design projects that integrate and apply biomimicry life's principles to achieve sustainable design solutions.
- 4 Develop a personal searching strategy to use as reference tool to apply biomimetic design concepts.
- 5 Identify different approaches to biomimicry in research and business by experts.
- 6 Work in a team context, including planning, task division.

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, project, online group work, online lecture, online seminar: coached exercises

Extra information on the teaching methods

Because of COVID19, changed working methods can be rolled out if this proves necessary

Learning materials and price

All learning materials will be provided in the course's website in Ufora

References

Course content-related study coaching

Interactive support via UFORA (forums, e-mail). In person: several contact moments are planned where students interact one-on-one with the lecturers about the progress, questions, problems and ideas about the theoretical content or about their practical assignments. Additional contact moments are possible on the demand of the student by electronic appointment.

Evaluation methods

end-of-term evaluation and continuous assessment

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

Written examination, participation, assignment

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

Written examination, participation, assignment

Examination methods in case of permanent evaluation

Oral examination, participation, peer assessment, report

Possibilities of retake in case of permanent evaluation

examination during the second examination period is possible in modified form

Extra information on the examination methods

Written examination: Quizzes range from 5-10 questions covering material from lectures and assigned readings, they are intended to give the student some practice in working through and applying concepts prior to taking exams.

Practical assignments: Throughout the semester we will work through various case studies that will help the student to better understand the topics covered during lectures. Some of these will be assigned as homework and some as in-class exercises.

Report: students write a short (2 page) design plan outlining a hypothetical biomimicry example from nature. The report describes the design (with goals and objectives) and technological and/or engineering solution that supports the enterprise.

Oral examination: presentation final team assignment.

Participation: students are evaluated on different aspects related to their active participation (incl. contributing to group discussions, working focused, interacting with lecturers and peers)

Peer-assessment: team work is evaluated by classmates.

Calculation of the examination mark

- 3 quizzes (28%),
- 4 assignment (44%),
- participation (8%),
- final assignment presentation (20%).
- total 100%