

## Biomimetic challenge

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<b>University:</b>	TUM
<b>Level:</b>	BA3, BA4, MA all years
<b>Teaching mode:</b>	completely online, at specific time
<b>Instructor(s):</b>	Prof. Dr. Harald Luksch, Gwillem Mosedale

### Short description

Biomimetics (“Learning from nature”) can yield innovative approaches to engineering problems, with a high potential for sustainable, resource- and energy-efficient solutions. In this course, we challenge teams with diverse backgrounds to work on biomimetic challenges. The entire project will take place online, from team formation via coaching events to the final presentation in a workshop. The objective is to progress new or existing ideas for further research or bioinspired start-ups..

### Full description

Biomimetics is ideal for interdisciplinary teams to progress ideas towards real world applications. “Learning from nature” can deliver highly innovative answers to many technical problems because nature’s solutions span a wide range of disciplines.

Students will work in interdisciplinary teams, either on a predefined technical challenge or they will investigate a biological specie for its technical potential. Various starting points are possible.

In the first sessions, participants will receive a quick foundation in biomimetics. During this time, there will be some but not much lecture-style content, which means learning will be mostly through (team) exercises that cover a broad range of topics. Participants can expect to be actively involved throughout.

Examples of introductory content are:

- working in interdisciplinary teams
- recognizing (technical) functions in nature
- developing different perspectives on problems/solutions
- biomimetic solutions in industry

The 3-month project will be entirely virtual using digital tools. There will be minimal teaching, learning will be via materials that are consultable in digital format assisted by coaching.

In addition, each team will receive two vouchers for a formal consultation with the organizers. This will consist of a 10 min pitch to explain their project status with subsequent advice from experts

Teams will present their final results in a virtual workshop. Assessment (accolade, grade) will be done both by experts in biomimetics (“expert vote”) and by all student participants (“popular vote”) in several categories where “innovation”, “application”, “documented process”, and “presentation” are conceivable.

Outstanding projects will be connected to research groups across the EuroTeQ Alliance or to transfer units to gauge their commercial potential (e.g. start-up). Other alternatives for continuation are master / PhD theses and participation in a biomimicry challenge.

## Learning outcomes

Students will be able to work along the biomimetic value chain by using bottom-up and/or top-down methods to identify possible biological systems, assessing these, transferring findings into a technically suitable description, to ultimately characterize potential technical applications.

## Recommended in particular for students of the following study programmes

Engineering, Industrial Design, Biology and, of course, Biomimetics

## General information

**Contact hours per week:** 3

**Total workload:** 90 (in student hours for the whole course)

**ECTS credits:** 3

**Language:** English

**Course start date:** 25 April 2023

**Course end date:** 18 July 2023

**Add. info about start date:**

**Weekly teaching day/time:** Tuesdays, 6pm to 7pm + self-study / team work

**Time zone:** CET (Denmark, Germany, France, Netherlands, Switzerland, Czech Republic)

**Further information:**

**Prerequisites:** Firm grounding in either (a) engineering, design, or MINT field combined with a strong interest/affinity for biology OR (b) biology. Industrial design students welcome.

**Activities and methods:** Group work, Self-study, Tutorial sessions

**Presence on campus:** not required

## Final examination

**Form:** project

**Date:**

**Location/format:** online

**Re-sit possibility:** no

- Transcript available:** TUM will issue an official certificate indicating the number of ECTS, grade and workload instead of a transcript of records.
- Add. info/requirements:** Workshop with presentation of Biomimetic project

## Registration

To register for this course, follow the registration requirements of your **home university** as specified here: [www.euroteq.eu/courses-registration](http://www.euroteq.eu/courses-registration).

## Administration

- Number of places:** 18
- Minimum participants:**
- Internal course code:** Biomimetic challenge
- Contact:** [euroteq.mobility@xzv.tum.de](mailto:euroteq.mobility@xzv.tum.de)

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*This course is part of the EuroTeQ Engineering University joint course catalogue 2023. This is a collaborative activity of the partner universities DTU, L'X, TU/e, TalTech, CTU, TUM as well as Technion. Students from these universities can participate in the offered courses. It is the responsibility of the student to check if you fulfil the requirements to participate in a specific course. Students are also advised to check with their home institution how to get recognition of the ECTS credits gained in courses of the EuroTeQ course catalogue. For further information about EuroTeQ Engineering University, visit [www.euroteq.eu](http://www.euroteq.eu) or get in touch with the above-mentioned point of contact.*