

Project in modelling of living systems

Subject area: Biology/Biomedical Engineering

University: L'X
Level: MA all years, PhD
Teaching mode: completely online, at specific time
Instructor(s): Arezki Boudaoud

Short description

This course provides a hands-on experience in the modelling of living systems, based on short lectures, on the study of research papers, and on a project.

Full description

Modelling approaches are increasingly applied to living systems. Such approaches serve to test whether a set of hypotheses is sufficient to explain the behaviour of a system, to design methods to act on this system, or to make up for experiments when they are impractical. Accordingly, most fields of life sciences and bioengineering are concerned by modelling.

This module will give the students an overview of the field, through lectures and study of research papers, and have them carry out a modelling project in small groups. Each group will define their topic, propose hypotheses from experimental data, formulate the corresponding model, solve it numerically, and discuss how to test the model experimentally.

Learning outcomes

Starting from biological hypotheses, at the end of the course, the learner will be able to build a model, solve it numerically, and put the results in an experimental context.

General information

Contact hours per week: 4 hours
Total workload: 60 hours (in student hours for the whole course)
ECTS credits: 5 ECTS
Language: English

Course start date: 03 January 2023

Course end date: 23 February 2023
Add. info about start date:
Weekly teaching day/time: 13:30-17:30, all Tuesdays from January 3rd to February 21st and Thursday February 23rd
Time zone: CET (Denmark, Germany, France, Netherlands, Switzerland, Czech Republic)

Further information:

Prerequisites: Introduction to molecular biology and cell biology
Differential equations; introduction to partial differential equations
Introduction to scientific programming (use of NumPy/SciPy, Matlab, or equivalent)
Activities and methods: Typical session: lecture (1h), study of papers (1h30), and project (1h30)
Presence on campus: no

Final examination

Form: project
Date: 07 March 2023
Location/format: online
Re-sit possibility: no
Transcript available: end of the semester and generally 8 weeks after the exam.
Add. info/requirements: written report (e.g. in the form of a notebook) and oral presentation

Registration

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

Administration

Number of places: 6
Minimum participants:
Internal course code: BIO/MEC580
Contact: euroteq-mobility@polytechnique.fr

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 or get in touch with the above-mentioned point of contact.