

BIO-464

**Scientific project design in cell and developmental biology**

Gönczy Pierre, Oates Andrew Charles

| Cursus                    | Sem.     | Type |
|---------------------------|----------|------|
| Life Sciences Engineering | MA1, MA3 | Opt. |

|                            |                     |
|----------------------------|---------------------|
| Language of teaching       | English             |
| Credits                    | 4                   |
| Withdrawal Session         | Unauthorized Winter |
| Semester                   | Fall                |
| Exam                       | During the semester |
| Workload                   | 120h                |
| Weeks                      | 14                  |
| <b>Hours</b>               | <b>4 weekly</b>     |
| Lecture                    | 1 weekly            |
| Exercises                  | 3 weekly            |
| <b>Number of positions</b> | <b>20</b>           |

**Remark**

only one registration per student to a scientific thinking course

**Summary**

Students are led to understand selected concepts in cell and developmental biology, primarily through the analysis of scientific literature, and then to apply these concepts to the design and execution of a group project in either the Gönczy or the Oates laboratory.

**Content****Learning Prerequisites****Required courses**

Bachelor, preferably in the Life Sciences, but motivated students from other disciplines are welcome, as are doctoral students.

**Learning Outcomes**

By the end of the course, the student must be able to:

- Recognize strengths and weaknesses of different experimental systems
- Realize the importance of control experiments
- Explain figures of a scientific paper
- Deduce conclusions from experimental data
- Distinguish key experiments from less important ones
- Propose next experiments to be conducted in a scientific study
- Use acquired knowledge to design and execute a scientific project

**Teaching methods**

The course is organized as follows in most weeks: in the first 60 minutes, scientific literature that has been read and analyzed by the students during the previous week is presented by them and discussed. After a short break, in the last 30 minutes, the teacher introduces the topic of the following week and provides one scientific paper to read and analyze for the following week.

During the last four weeks of the course, students form groups and use the knowledge gained until then to design and

execute a small scientific project embedded in the research conducted in the Gönczy and Oates laboratories.

### **Expected student activities**

In addition to attending class, students are expected to thoroughly read and analyze the papers, so that they can participate actively in the presentations and discussions. Moreover, they are expected to show dedication during the project design and execution in the last four weeks. Four hours of personal study per week are expected on average.

### **Assessment methods**

Students will be evaluated during the semester on the quality of the presentations and discussions in class (1/3 of the grade), on a continuous evaluation in the middle of the semester (1/3 of the grade), and on the scientific project design and execution component (1/3 of the grade).

### **Resources**

#### **Moodle Link**

- <https://go.epfl.ch/BIO-464>