**EPFL**

BIO-449      **Understanding statistics and experimental design**

Herzog Michael

| Cursus | Sem. | Type |
|---|---|---|
| Bioengineering | MA1, MA3 | Opt. |
| Civil & Environmental Engineering | | Obl. |
| Electrical Engineering | | Obl. |
| Life Sciences Engineering | MA1 | Opt. |
| Neuroscience | | Opt. |
| Sciences du vivant | MA1, MA3 | Opt. |

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|---|---|
| Language of teaching | English |
| Credits | 4 |
| Session | Winter |
| Semester | Fall |
| Exam | Written |
| Workload | 120h |
| Weeks | 14 |
| **Hours** | **4 weekly** |
| Courses | 2 weekly |
| Exercises | 2 weekly |
| **Number of positions** | |

**Remark**

The course is for MA students and in particular for PhD students.

**Summary**

This course is neither an introduction to the mathematics of statistics nor an introduction to a statistics program such as R. The aim of the course is to understand statistics from its experimental design and to avoid common pitfalls of statistical reasoning. There is space to discuss ongoing work.

**Content**

Sensitivity and Bias
Statistical Power
Bayes Theorem and Odds Ratio
What the t-test measures
Classical statistical tests
Experimental design
Fraud and misconduct of statistics

**Learning Prerequisites**

**Required courses**

Very Basic Mathematics