

Elective Module

Master Program Biological Sciences – WS 2022/23

## Data analysis in the life sciences

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Modern biology research increasingly requires the ability to analyze large data sets. The main goal of this module is to gain basic programming skills in Python and hands-on experience with the quantitative analysis of experimental data, the numerical solution of simple mathematical models, and the presentation of the results. No previous programming skills are required.

After a detailed introduction into basic programming with Python, students will work in small teams on specific exercises and small projects. These projects will use recent experimental data covering topics from different areas of biology. Specific examples include large data sets from systems biology (e.g. chemical genomics) and flow cytometry. In addition, the numerical solution of simple mathematical models of biological phenomena and statistical techniques such as null models and bootstrapping will be covered. Finally, the course participants will learn how to visualize their results in publication-quality figures.

After the practical course, each student has to take an oral exam about their analysis methods and results for one project.

*Credit Points: 6*

*Dates: 23.02. – 10.03.2023; daily 10:00 – 17:30.*

*Location: Course Room II, Biocentre (online only if required by current pandemic situation)*

*Registration: At most 24 students can participate. Registration deadline is Jan 10, 2023. To register, please contact [gansmann@uni-koeln.de](mailto:gansmann@uni-koeln.de), stating in which program you are enrolled and your Ilias username.*

*Equipment: Usually, it's best if you bring own laptop (or similar). If you can't, mention this as early as possible and we will find a solution.*