

Elective Module

Master Program Biological Sciences – WS 2019/20

## 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 or flow cytometry data) and the quantitative analysis of fluorescence microscopy images. In addition, the numerical solution of simple mathematical models of biological phenomena and statistical techniques such as principal component analysis and bootstrapping will be covered. Finally, the course participants will learn how to visualize their results in publication-quality figures.

To understand the problems and data sets, the participants need to read the relevant literature as course preparation. After the practical course, each student has to take an oral exam about her/his analysis methods and results for one project. Computers can be provided.

**Credit Points:** 6

**Dates:**

Feb 3 – 18, 2020; daily 10:00 – 17:30

**Location:**

RRZK (Weyertal 121), Room 0.12, ground floor (Kursraum 1)

**Registration:**

Maximum 23 students can participate. Registration deadline is Jan 10, 2020. To register, please contact [t.bollenbach@uni-koeln.de](mailto:t.bollenbach@uni-koeln.de).