Elective Module

Master Program Biological Sciences – WS 2017/18

Data analysis with Matlab

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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 Matlab* (or its free alternative GNU Octave) and hands-on experience with the quantitative analysis of experimental data as well as with 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 Matlab, 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), behavioral 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 students need to read the relevant literature as course preparation. After the practical course, each student has to write a report based on her/his analysis methods and results for one project. Computers can be provided.

Credit Points: 6

Dates for practical course:

Feb 15 - Mar 2; daily 10:00 - 17:30

Location: Institute for Genetics (Zülpicher Straße 47a), Computer pool (ground floor)

Registration:

Maximum 14 students can participate. Registrations deadline is Jan 6. For registration, please contact t.bollenbach@uni-koeln.de.

* Matlab is freely available to students enrolled at the University of Cologne