Biological databases and analysis of macromolecular sequences

Lecturer
Didier GONZE (Coordinator)

Course mnemonic
INFO-F434

ECTS credits
5 credits

Language(s) of instruction
English

Course period
First term

Campus
Plaine

Course content

Databases constitute the informatic response to the storage and the management of the (biological) information. The course will give an overview of biological databases and of their structure. A particular attention will be given to annotation problems and to the reliability of the data. In the second part of the course, we will present various methods of analysis of macromolecular sequences. Those methods include (1) DNA and protein sequence alignment (dot plot, pair-wise alignment, multiple alignment), (2) matching sequences in databases (BLAST), (3) representation and search of motifs in sequences, and (4) the prediction of 3D structural elements on the basis of the composition of the sequences. Various algorithms and softwares for biological sequence analyses will be described and compared. The implementation of some of these algorithms will be the object of the practicals (supervised by Ch. Nachtegael). The course will also introduce some statistical notions related to the analysis and comparison of sequences.

Objectives (and/or specific learning outcomes)

The goal of the course will be to introduce the students to biological databases and to methods of analysis of macromolecular sequences (DNA, RNA, and proteins)

Teaching method and learning activities

lectures, practicals

References, bibliography and recommended reading

Zvelebil and Baum, "Understanding Bioinformatics", Garland Science, 2007

Course notes

Université virtuelle

Other information

Place(s) of teaching

Plaine

Contact(s)

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Evaluation method(s)

Oral examination

Evaluation method(s) (additional information)

Written examination (50%) + practicals (50%). In case of failure in one part, the final note will be the note of that part. In 2nd session, the student can either keep the note of the successful part and present it again. In case of failure in the two parts, the final note will be the lowest note of the two parts and the student must present the two parts in 2nd session.

Determination of the mark (including the weighting of partial marks)

The final note will take into account the evaluation of the practicals (50%) and the written exam (50%). If the note obtained in one of the two parts is below 10/20, this note will be taken as the final note.

Main language(s) of evaluation

English and French

Programmes

Programmes proposing this course at the faculty of Sciences

MA-BINF | Master in Bio-informatics and Modelling | finalité Research/unit 1