



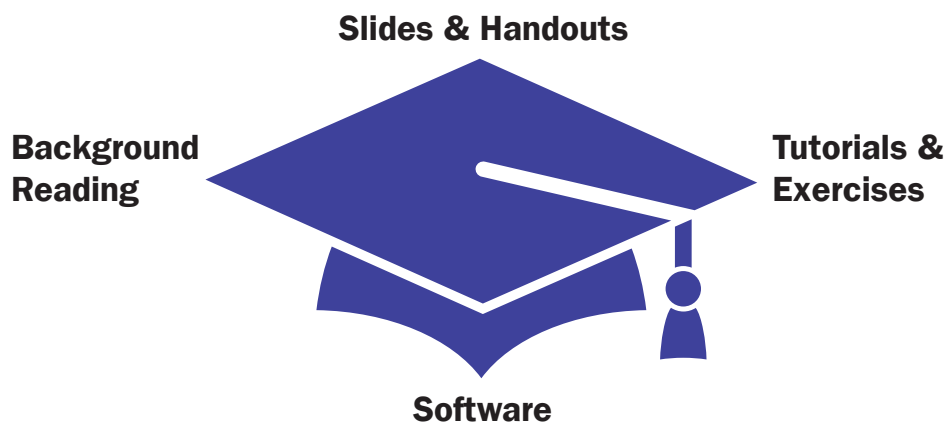
CLC Educational Package

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The CLC Educational Package for bioinformatics teaching

The CLC Educational Package is a complete solution for your bioinformatics teaching needs. The package includes professional software for advanced analyses, tutorials and exercises for a smooth introduction to bioinformatics, slides and handouts; furthermore, our background reading Bioinformatics Explained, provide reader-friendly surveys of a number of scientific fields within bioinformatics.

You can easily pick out the subjects of interest of your course and benefit from the interaction between software, exercises, and scientific articles. Furthermore, with the complete solution from CLC bio you can teach your students High-Performance Computing and give everyone hands-on experience in developing bioinformatics software by the use of CLC Developer Kit.



Software

CLC Combined Workbench

CLC Combined Workbench is an outstanding tool for teaching bioinformatics as it integrates a large number of advanced protein, DNA, and RNA sequence analyses. Using CLC Combined Workbench you can reach broadly within bioinformatics from just one software environment. E.g. you can teach your students about alignments, phylogenetic analyses, and a number of advanced DNA, RNA, and protein analyses, and you can work with advanced primer design, sequencing data analysis, and in silico cloning.

CLC Developer Kit

CLC Developer Kit allows you to create specialized plug-ins and modules which can be fully integrated with your CLC Workbench.

With the CLC Developer Kit your students can easily get hands-on experience with the development of bioinformatics software. You can use the Developer Kit to teach your students how to develop specialized bioinformatics algorithms to be integrated with smooth data management, and excellent graphical viewing and output options or you can use the Developer Kit to customize your CLC Workbench to fit specific needs in your teaching of bioinformatics.

CLC High Performance Computing (optional)

CLC High-Performance Computing accelerates bioinformatics algorithms on your desktop computer.

Precise database searches are time-consuming; however, our solutions boost the performance of your desktop computer so a calculation that would normally take hours can now be done in a few minutes. With the CLC Bioinformatics Cube and the CLC Bioinformatics Cell we bring high-performance computing into desktop-based bioinformatics, and by using a complete CLC bio Educational Solution you can introduce these innovative solutions to your students.

Support

All CLC bio's software solutions come with free user support, and that even goes for our software for educational purposes.



CLC Educational Package

Background reading

Background reading includes *Bioinformatics Explained* and *Case Studies*. *Bioinformatics Explained* are articles introducing subjects of relevance in bioinformatics teaching by objective descriptions and discussions. Using our *Bioinformatics Explained* in your teaching gives you the possibility to introduce your students to a number of general and important topics within the field of bioinformatics. The students will get an overview of specific bioinformatics areas, and because the CLC Educational Package is fully integrated you can couple the theory explained in the background reading with exercises using CLC Combined Workbench.

Case studies are real-world examples of laboratory workflows and the use of bioinformatics solutions for data analysis.

Tutorials & exercises

On-line tutorials

A number of tutorials are available to give you a quick and easy introduction to using your CLC Workbench. The tutorials guide you through some of the main features, and taking tutorials is a fast and smooth way to understand how to use the software. You can use our on-line tutorials to quickly introduce the students to CLC Combined Workbench. Everyone can get started by taking the Basic Tutorials and from the Additional Tutorials you can teach the students how to use CLC Combined Workbench for specific analysis of relevance to your bioinformatics course.

Exercises

Exercises related to a number of the subjects handled by the CLC Educational Package are available. The exercises are general introductions to the specific areas of bioinformatics, and each exercise is supported by the use of CLC Combined Workbench. They are stand-alone routines so you can easily pick the exercises related to the subject of relevance in your bioinformatics teaching.

The exercises included in the Educational Package all include example data. This means that you can use the CLC Educational Package as a complete solution – you do not need to invent exercises and find example data yourself.

Slides & Handouts

Slides and handouts related to a number of bioinformatics subjects are available. To maximize your

benefits of using the CLC Educational Package and the integration of software, background reading and teaching material, the slides and handouts should be the natural choice for your lecture.

All exercises, slides and handouts are prepared in PowerPoint/Word so that you can modify and supplement them in order to fit the specific needs of your course.

Example Curriculum

Lessons, General Bioinformatics

- Alignments
- Phylogenetic trees
- Nucleotide analysis
 - Search for open reading frames
 - Translation
- BLAST
 - BLAST against NCBI and against local database
- Database search
 - NCBI
 - UniProt
- Dot plots
- RNA analysis
 - Structure prediction
 - Graphical representation of structures
- Protein analysis
 - Prediction of secondary structure, signal peptides and transmembrane helices
 - 3D molecule analysis
 - Pfam domain search
 - Antigenicity & hydrophobicity
 - Proteolytic cleavage
- Motif search and pattern discovery

Lessons, Practical Bioinformatics

- Sequencing data analysis
 - Assembly, including reference assembly
 - Trimming
 - SNP analysis
- Primer design
 - Primer parameters
 - Standard PCR, nested PCR, and TaqMan
- In silico cloning
 - Graphical representation
 - Restriction site analysis
 - Cloning experiments