UCLouvain

wsbim1207

2025

Introduction to bioinformatics

3.00 credits	15.0 h + 20.0 h	Q2

Teacher(s)	Gatto Laurent ;
Language :	French
Place of the course	Bruxelles Woluwe
Prerequisites	*The prerequisite(s) for this Teaching Unit (Unité d'enseignement – UE) for the programmes/courses that offer this Teaching Unit are specified at the end of this sheet.*
Main themes	This introduction to bioinformatics and data science applied to biomedical sciences will introduce students methodologies and technologies used in bioinformatics. They will learn how to manage bioinformatics projects and how to manipulate and visualise data of average size.
Learning outcomes	**At the end of this learning unit, the student is able to :** 1 After this course, the students will understand what bioinformatics is and when to use it. They will be able to · Analyse a simple bionformatics problem, and implement a bioinformatics solution to solve it. · Decompose a problem in simpler sub-problems and solve these as analysis scripts. · Read and understand existing scripts. · Use informatics tools to help and support their programming tasks. · Understand technical documentation for the R programming language and Bioconductor vignettes. · Write their own R scripts and small analysis reports in Rmd. This course contributes to the leaning goals 2a, 2c, 3c, 5a, 5b, 5c, 5d of the bachelor's programme in biomedical sciences.
Evaluation methods	The final exam will be practical and computer-based; the students will prepare a reproducible report in Rmd using RStudio answering exam questions addressing small scale data analysis task similar to those presented during the course. A student may be refused registration for the exam if they have not regularly participated in the learning activities or the various stages of the teaching program.
Teaching methods	The course will be composed of practical sessions, during which the students will implement solutions to data analysis problems relevant to biomedical sciences using the R programming language and the RStudio development environment. Tests will be organised on a regular basis to allow for students to assess their learning throughout the course. Course attendance to all sessions (volume 1 and 2) is mandatory.
Content	This introductory course to bioinformatics will focus on the following themes: · What is bioinformatics and it application domains. · Technologies and methodologies used in bioinformatics. · Introduction to omics data and technologies. The data science applications to biomedical sciences will focus on: · Data analysis project management and reproducible research. · Spreadsheets for data organisation. · The RStudio programming environment. · Data analysis and programming in R . · Introduction to data structures in R. · Data handling and visualisation. · High throughput data with R and Bioconductor .
Inline resources	The course material is available online: https://uclouvain-cbio.github.io/WSBIM1207/
Other infos	This course is *English friendly* : lecture notes and additionnal matieral are in English, students can ask their questions in English during the class, and questions and answers can be provided in English during the final evaluation.

Faculty or entity in charge	SBIM

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Additionnal module in Biomedical Sciences	APPSBIM	3		🔍
Bachelor in Biomedicine	SBIM1BA	3	WMD1102 AND WSBIM1001 AND LANGL1854	🔍