

System Biology II

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Course organization:

The course module is organized in 16h of lectures and 9h of tutorials to introduce knowledge and methodological tools.

Targeted learning objectives:

Global analyses (omics) currently generate large datasets that do not capture the complexity of living systems. Systems Biology is an approach where omics data are integrated and exploited (compared) through mathematical models of biological systems or sub-systems. The complexity of biological systems and the diversity of issues to be considered require the use of different types of modelling.

In this course, students will explore a number of mathematical approaches to tackle biological issues through the integration of "omics" data. The mathematical approaches include the methods known as constraint-based modeling, i.e. flux balance analysis, resource balance analysis, but also tools specific to the analysis of dynamic systems and Boolean systems.

On completion of the course, students will be able to :

- Understand and explain the challenges of using constraint-based modeling approaches to describe cellular behaviors
- Summarize and present a scientific paper in the field