

Systems Biology

Courses

Compulsory courses		
Concept courses		
Systems Biology	551-0324-00L	6
Elective compulsory courses		
Concept courses		
Bioinformatics	551-1299-00L	6
Cellular Biochemistry (Part I)/Cellular Biochemistry (Part II)	551-0319-00L/551-0320-00L	6
Concepts in Modern Genetics	551-0309-00L	6
Microbiology (Part I)/Microbiology (Part II)	551-0313-00L/551-0314-00L	6
Master courses		
<i>Autumn semester</i>		
Cell Biophysics	227-0939-00L	6
Computational Systems Biology	636-0007-00L	6
Evolutionary Dynamics	636-0009-00L	6
From DNA to Diversity: The Evolution of Multicellular Organisms (University of Zurich)	551-0571-00L	2
Spatio-Temporal Modelling in Biology	636-0706-00L	4
Systems Biology of Metabolism	551-1153-00L	4
<i>Spring semester</i>		
A Problem-Based Approach to Cellular Biochemistry	551-1310-00L	6
Advanced Proteomics	551-0224-00L	4
Applied Multivariate Statistics	401-0102-00L	5
EXCITE Interdisciplinary Summer School on Bio-Medical Imaging	227-0396-00L	4
Functional Genomics	551-0364-00L	3
Infectious Disease Dynamics	701-1708-00L	4
Microbial Biochemistry	551-1103-00L	4
Modelling Course in Population and Evolutionary Biology	701-1418-00L	4
Statistical Models in Computational Biology	636-0702-00L	6
Synthetic Biology I	636-0111-00L	4
Technologies in Molecular Microbiology	551-1126-00L	4
Recommended Master courses		
Scientific Writing for Life Sciences and Chemistry	529-0079-00L	1
Writing Scientific Reports for MSc Biology	551-0575-00L	2

Master courses

According to agreement with study advisor

Elective courses in Humanities, Social or Political Sciences
(min. 2 CP)

About this major

Systems biology targets networks, cells, organs and complete organisms by integrating experimental data with computational and theoretical approaches. It thus combines concepts from different scientific disciplines to obtain a quantitative understanding of complex biological systems in terms of their components and interactions. Experimentally, the focus is on development and application of novel quantitative methods for global analysis of cellular components (e. g. the proteome or metabolome) and their manipulation, for example through small interference (si) RNA screens. Computationally, the focus is on developing bioinformatics methods for data analysis and mathematical models for in silico experiments. Model-based integration of large and heterogeneous data sets opens new perspectives for deeper insights into human disease as well as development of new therapies and novel biotechnological processes. This interdisciplinary major is designed for biologists, bioinformaticians and computer scientists and promotes interdisciplinary communication skills. Depending on interest and capabilities, a focus on theoretical or experimental aspects will be encouraged.

The successful completion of the Master programme in Systems Biology prepares the student for a professional career in scientific research areas concerned with biological questions on the cellular, organismal, bioanalytical and computational level. It provides a solid scientific background for further academic studies towards a PhD followed by postdoctoral training. In addition, it provides a solid background on the modern work flows in industry, and the scientific profile desired for competitive positions in biotechnology, biomedical and pharmaceutical industry.

Study advisor



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