

Module number	MM9
Module name	Fundamentals of Bioinformatics
Program of Study	MSc mandatory module
Offered	Once a year, wintersemester
Module coordinator	Prof. Dr. Christian Jung
Module advisor	Prof. Dr. Christian Jung
Courses and teachers	<p>Lecture: Bioinformatics intensive course (F. Schreiber^{1,2}, U. Scholz¹, B. H. Junker¹, S. Friedel, H. Knüpffer¹, C. Klukas¹)</p> <p>Exercise: Bioinformatics intensive course (F. Schreiber^{1,2}, U. Scholz¹, B. H. Junker¹, S. Friedel¹, H. Knüpffer¹, C. Klukas¹)</p> <p>¹ Leibniz Institute for Plant Genetics and Crop Plant Research (IPK), Gatersleben ² Martin-Luther-University (MLU), Halle-Wittenberg</p>
Prerequisites	Advanced understanding of genetics and genomics according to the module "Introduction to molecular biology" and "Organization and analysis of eukaryotic genomes "
Language	English
Module capacity on campus students	20
Module capacity off campus students	20
Registration	From October 1 st to November 30 th via the OLAT e-learning platform
Course types (classroom/ total workload)	Lecture (45 h /135 h), exercise (15 h/45 h)
Schedule	Taught on five consecutive days at the Leibniz Institute for Plant Genetics and Crop Plant Research (IPK) in Gatersleben during the non-lecture period in spring
Grading	Written examination: 100% (F. Schreiber, C. Jung)
ID-card	Required for exams
European Credit Points	6
Module Objectives	<p>Applying current methods and programs (algorithms) for bioinformatics and use of databases</p> <ul style="list-style-type: none"> ▪ Databases for sequences, structures and biological networks ▪ Overview of bioinformatics software tools ▪ Limitation to publicly available databases and tools ▪ Applying online tools to find plant resources for biology and agricultural research
Contents	<ul style="list-style-type: none"> ▪ Basics ▪ Molecular biological databases ▪ Sequence comparison ▪ Genome analysis ▪ Expression data analysis ▪ Analysis of metabolic processes ▪ Phylogeny ▪ Basics of data structure and algorithms ▪ R and BioConductorPerl programming

- Molecular biological data integration
- Analysis of networks
- Modelling and simulation
- Documentation of plant genetic resources
- Biodiversity

Taught skills

Methodical responsibility, key qualifications

Course materials

to be announced at the beginning of the course