



ALMA MATER STUDIORUM  
UNIVERSITÀ DI BOLOGNA  
SCHOOL OF PHARMACY, BIOTECHNOLOGY, AND SPORT SCIENCES

**SCHOOL OF PHARMACY,  
BIOTECHNOLOGY,  
AND SPORT SCIENCES**

# GENOMICS

**FIRST CYCLE  
DEGREE  
PROGRAMME/  
BACHELOR**

**BOLOGNA**

# GENOMICS

Genomics is an international first-cycle degree programme taught in English, training biotechnology and life sciences graduates who are specifically qualified to apply maths, statistics and computing to the structural and functional analysis of genomes. Genomics graduates will be able to interrogate, organise, annotate and curate biological datasets and provide tools and insights for the comprehension of -omic data and systems biology of prokaryotes and higher organisms, including humans.

## REQUIREMENTS AND ADMISSION PROCEDURES

Admission to the 1<sup>st</sup> Cycle Degree Programme in Genomics is subject to the possession of a five-year high school diploma or other equivalent qualification obtained abroad. Admission is also subject to solid knowledge and abilities in mathematics, logical reasoning and sciences, as well as an English language proficiency to level B2 or higher.

## LEARNING OUTCOMES

Students will gain thorough knowledge in genetics and molecular biology, including in-depth understanding of expression and organization genomes. They will gain strong competences in computer programming, biostatistics, multiscale modelling and computational simulations as well as theoretical modelling and algorithms applicable to quantitative biology. Specifically, successful graduates will possess advanced biocomputing skills for gene-bank data mining, annotation, and management, as well as theoretical knowledge and practical skills for the analysis of biological communities, cell populations and complex systems. Students will also learn the fundamentals of bioethics for the management of sensitive information.

## PROGRAMME CONTENT

Mathematics, Physics, Chemistry, Statistics, Data Science;  
Programming, Bioinformatics;  
Molecular Biology of the Cell, Genetics, Genomics, Metabolomics, Epigenomics, Metagenomics, 3D Genomics, Biological Networks;  
Bioethics.

## CAREER OPPORTUNITIES

Universities and Research Institutions, Centers for translational research, advanced diagnostics, companies working in the ICT, biotechnological, biomedical, industrial, pharmaceutical, environmental and agribusiness sectors. Other employment opportunities include Biocomputing counselling in forensic sciences and trials. Graduates may also specialize their profiles, choosing from a wide range of second cycle degree programmes run by the University of Bologna, including Molecular and Industrial Biotechnology, Pharmaceutical Biotechnology, Molecular and Cellular Biology and Biocomputing.

**PROGRAMME DIRECTOR: Prof. Giovanni Perini**

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