Bioinformatics and Computational Biology

Saint Louis University is a Catholic, Jesuit institution that values academic excellence, life-changing research, compassionate health care, and a strong commitment to faith and service.

Founded in 1818, the University fosters the intellectual and character development of nearly 14,000 students on two campuses in St. Louis, Missouri, and Madrid, Spain. Building on a legacy of nearly 200 years, Saint Louis University continues to move forward with an unwavering commitment to a higher purpose, a greater good.

OVERVIEW

The Master of Science in bioinformatics and computational biology degree is a new interdisciplinary program that pulls together the expertise of Saint Louis University's departments of biology, chemistry and mathematics and computer science.

The use of computational techniques and information systems has revolutionized research in the biological sciences — from the analysis of DNA sequences and the understanding of gene expression and regulation to the structural modeling of proteins and RNAs and the evolutionary relationship between species. The fields of bioinformatics and computational biology have become the important academic discipline for such breakthroughs and a critical part of success for firms in the biotechnology sector.

In addition to a basic understanding of the life sciences, the master's program teaches students the fundamentals of computation and analysis of big data sets. Ultimately, the program trains students in the use of computational methods to model and solve problems with complex biological systems.

Curriculum
The 30-credit-hour program is designed for students with academic backgrounds in the life sciences, mathematics and computer science, health sciences and medicine. The curriculum consists of a mix of required courses that build a strong foundation in bioinformatics and computational biology and elective classes that allow students to specialize their expertise. Students are expected to complete the program in one and a half to two years.

Courses include:
• Introduction to Biochemistry I and II
• Bioinformatics Algorithms
• Genomics
• Seminar in bioinformatics
• Biology electives: cellular and molecular genetics, advanced molecular biology, molecular phylogenetic analysis
• Computing electives: machine learning, high performance computing, databases
• Additional electives in biology, biochemistry, chemistry, computer science and mathematics

Internship
Students are required to complete either a research experience with SLU faculty or an internship with a biotech firm in the St. Louis area, which is home to one of the largest concentrations of biotech companies in the country. This requirement gives students the opportunity for hands-on experience working with academic researchers or private industry.

Career Options
Computing has become integral to fields such as genetics, pharmacology, ecology, genomics, structural biology, disease genetics, biochemistry, medical imaging and systems biology. There are many employment opportunities for graduates in the biotechnology, pharmaceutical, health care and software industries, as well as academic, private and governmental research labs.

Accelerated Bachelor's/Master's Program
The program offers an accelerated option that allows undergraduate students at Saint Louis University to earn a M.S. in bioinformatics and computational biology and an undergraduate degree in biology, biochemistry, computer science or mathematics. Full-time students can typically finish the program in five years.

For more information about the program, visit us online at bioinformatics.slu.edu.
COLLEGE OF ARTS AND SCIENCES

Bioinformatics and Computational Biology

FACULTY

Department of Biology
Gerado Camilo, Ph.D.: Ecology and biostatistics
Brian Downes, Ph.D.: Plant molecular biology
Jack Kennell, Ph.D.: Mitochondrial-nuclear interactions and retroplasmids
Zhenguo Lin, Ph.D.: Evolution of genome and gene regulation

Department of Chemistry
Brent Znosko, Ph.D.: Biochemistry, thermodynamics and NMR of nucleic acids

Department of Mathematics and Computer Science
Tae-Hyuk (Ted) Ahn, Ph.D.: Bioinformatics, high-performance computing, big data analytics, computational science
Erin Chambers, Ph.D.: Computer algorithms, geometric and topological algorithms
Michael Goldwasser, Ph.D.: Computer algorithms and data structures
Haijung Gong, Ph.D.: Biostatistics and cancer models
Benjamin Hutz, Ph.D.: Number theory and dynamical systems
David Letscher, Ph.D.: Geometric and topological algorithms, high performance computing

CONTACT INFORMATION
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APPLICATION DEADLINE
M.S.
FALL: Feb. 1
SPRING: N/A
SUMMER: N/A

DEGREES OFFERED
• Master of Science (M.S.) in Bioinformatics and Computational Biology

COURSES AVAILABLE

APPLICATION REQUIREMENTS
• Application form and fee
• Three letters of recommendation
• Resume
• Goal statement
• GRE scores
• TOEFL/IELTS scores (international students only)

FINANCIAL SUPPORT
Research and teaching assistantships through the program are available to well-qualified candidates. Further support is available through external research grants (NSF, NIH, etc.). These assistantships provide tuition, a $24,000 stipend and health insurance.

Higher purpose. Greater good.™

SAINT LOUIS UNIVERSITY

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