

Minor in Bioinformatics

In the early 21st century we have gained the ability to decipher and manipulate the genetic information of organisms. We have also seen dramatic advances in imaging technologies from the macro to nano scales (Satellites/UAVs, hyper-spectral imaging, GPS, MRI, confocal and two-photon microscopy, x-ray crystallography, etc.). Concomitant with, and underlying these advances, has been a revolution in information technology in which we have seen ever-accelerating computational processing speeds and ever more massive data sets. These changes are driving a fundamental transformation of the biological sciences.

In order to provide our students with the educational foundation they need to not just flourish, but to lead in this dramatically altered environment, we are offering a new **minor** in the area of **Bioinformatics** to provide effective training at the interface of biological applications and computational tools. While students will be trained using the most advanced tools and applications available, the minor will focus on core concepts and approaches, to provide a durable skill set that can be applied to new tools and applications that will inevitably develop. The core curriculum of the minor will cover the essentials of effective computation, as well as the handling, exploration and utilization of large data sets.

Core curriculum (16-17 cr total): A student must complete at least one course in each of 5 categories. In addition, while not required, independent research is strongly encouraged.

Introduction to computation (4 cr)

Choose one of the following courses:

CSCE 110, Programming I (4 cr)

CSCE 111, Introduction to Computer Science Concepts and Programming (4 cr)

Biological molecules and processes (3 cr)

Choose one of the following courses:

BIOL 213, Molecular Cell Biology (3 cr)

GENE 302, Principles of Genetics (3 cr)

GENE/BIMS 320, Biomedical Genetics (3 cr)

Bioinformatics fundamentals (3 cr)

BIOL 451, Bioinformatics

Computational bioinformatics (3 cr)

BIOL 350, Computational Genomics (3 cr)

Applied bioinformatics (3-4 cr)

Choose one of the following:

BIOL 450, Genomics (4 cr)

BICH 464, Bacteriophage Genomics (3 cr)

BICH/GENE 419 Computational Techniques for Evolutionary Analysis

VTPP 438, Analysis of Genomic Signals (3 cr)

BIOL 430, Biological Imaging (4 cr)

STAT 446, Statistical Bioinformatics (3 cr)

Independent research

Independent experiences that are tailored to student interests and administered through 491 Research courses offered in multiple departments/programs are strongly encouraged.

NOTE: If a course in statistics is not already required for the student's major then STAT 211, 301, 302, or 303 is strongly recommended.

Hours Completed _____
Catalog Term _____

DECLARATION OF MINOR IN BIOINFORMATICS

Name: _____ Date: _____
UIN: _____ Major: _____
Email: _____ Expected Grad date: _____

COURSE NUMBERS

Grade of "C" or better required in all courses used to meet minor requirements.	CREDIT HOURS
A) CSCE110 or CSCE111	4
B) BIOL213, GENE302 or GENE/BIMS320	3
C) BIOL 451	3
D) BIOL350	3
E) Choose one from the following:	3-4
BIOL450, BICH464, BICH/GENE419, VTPP438,	
BIOL430 or STAT446	
TOTAL	16-17 HOURS

Student Signature: _____ Date: _____

Reviewed and Approved:

Minor Department Authorized Approval Signature: _____

Date: _____ Office Phone: _____

Reviewed and Approved:

Major Department Authorized Approval Signature: _____

Date: _____ Office Phone: _____

[] Entered in COMPASS form SZAREGS on _____ (Date) By Major Department

Copy sent to: Student's Dean, Student, Major Dept. and Minor Dept.