

# MAJOR IN CHEMISTRY, CONCENTRATION IN BIOINFORMATICS

The purpose of this interdisciplinary concentration is to prepare students to enter computer-intensive fields of bioinformatics, computational biology, computational chemistry, and molecular modeling including genomics and proteomics. With the advent of the Human Genome Project, an explosion of genomics information has occurred and databases such as GenBank and EMBL have grown at a rate that now requires storage, organizing, and indexing of the information. Questions of gene expression have led to computational biology, the process of analyzing genomic sequences, and to the field of proteomics, the understanding of protein structure and function. The information obtained by computational biology and computational chemistry is used in the design of new drugs to treat a variety of diseases. Major drug and biotechnology companies are seeking people trained in bioinformatics.

## Requirements for a Major in Chemistry, Concentration in Bioinformatics

Code	Title	Credits
<b>Core (46 credits)</b>		
CH-120 & CH-121	General Chemistry I and General Chemistry II	8
CH-201 & CH-202	Organic Chemistry I (lecture) and Organic Chemistry II (lecture)	6
CH-203 & CH-204	Organic Chemistry Laboratory I and Organic Chemistry Laboratory II	4
CH-301 & CH-302	Physical Chemistry I (Lecture Only) and Physical Chemistry II (Lecture Only)	6
CH-260	Chemistry Literature Seminar	1
CH-303	Physical Chemistry Laboratory I	2
CH-210	Chemical Analysis: an Introduction to Modern Methods	5
CH-475	Chemistry Seminar	2
Plus a minimum of 12 credits at the 300 level or above, at least one of which must be a lab course. Internships and Independent Study may contribute no more than 3 credits toward this requirement.		12
<b>Ancillary Courses (16 credits)</b>		
MA-200 & MA-201	Calculus I and Calculus II	8
PY-241 & PY-242	Physics I (Mechanics) and Physics II (electricity, Magnetism and Optics)	8
<b>Concentration in Bioinformatics (25 credits)</b>		
BI-203	Genetics <sup>1</sup>	4
BT-378	Bioinformatics	4
CS-140	Introduction to Programming	4
CS-242	Data Structures	3
CS-135	Programming for Non-CS Majors	3
CS-265	Database Applications	3
Select one of the following:		4
BI-203	Genetics <sup>1</sup>	
BI-204	Microbiology	
BI-306	Developmental Biology <sup>1</sup>	
BI-371	Advanced Topics in Cell and Molecular Biology <sup>1</sup>	

BI-375	Virology <sup>1</sup>
BT-376	Biotechnology
<b>Total Credits</b>	
<b>87</b>	

<sup>1</sup> Requires additional prerequisite courses beyond those required for the major and concentration.

Students must earn a C- or higher in all prerequisite courses in order to register for a chemistry or ancillary course.