# Bioinformatics

## Instructions to Students

Students must take at least 15 credits of the following courses, including at least one course from each of the four groups (A-D). A single course cannot fulfill more than one group requirement. Credits used to satisfy the minimum requirements for a student’s major cannot also be used toward the 15 credits for the bioinformatics minor:

* If your major requires related coursework or a concentration, only these credits can be applied to the minor.
* If your major only requires a total number of overall credits, you may apply up to 12 credits towards the minor.

In addition, students must obtain a signature from a member of the Bioinformatics Oversite Committee indicating that they have satisfied the minor requirements before submitting the plan of study to the Office of the Registrar.

### A. Bio-Computer/Computer Science

Complete at least one of the following courses:

* MCB 3421. Introduction to Molecular Evolution and Bioinformatics (3 credits)
* MCB 3602W. Introduction to Bioinformatic Tools for Microbial Genome Annotation (1 credit)
* MCB 3637. Practical Methods in Microbial Genomics (3 credits)
* MCB 5429. Theory and Practice of High Throughput Sequence Analysis (2 credits)
* MCB 5430. Analysis of Eukaryotic Functional Genomic Data (3 credits)
* MCB 5472/EEB 5372. Computational Methods in Molecular Evolution (3 credits)
* EEB 4100. Big Data Science for Biologists (4 credits)
* EEB 4230W. Methods of Ecology (4 credits)
* EEB 5348. Population Genetics (3 credits)
* EEB 5350. Molecular Systematics (2 credits)
* CSE 2102. Introduction to Software Engineering (3 credits)
* CSE 2300W. Digital Logic Design (4 credits)
* CSE 3500. Algorithms and Complexity (3 credits)
* CSE 3502. Theory of Computation (3 credits)
* CSE 3800/BME 4800. Bioinformatics (3 credits)
* CSE 3810/BME 3810. Computational Genomics (3 credits)
* CSE 4102. Programming Languages (3 credits)
* CSE 4701. Principles of Data Bases (3 credits)

### B. Data Banks/Statistics

* STAT 2215Q. Introduction to Statistics II (3 credits)
* STAT 3025Q. Statistical Methods (Calculus level I) (3 credits)
* STAT 3375Q and 3445. Introduction to Mathematical Statistics (3 credits each)
* CSE 4701. Principles of Data Bases (3 credits)

### C. Protein Structure/Biochemistry

* MCB 2000. Introduction to Biochemistry (4 credits)
* MCB 3010. Biochemistry (5 credits)
* MCB 3421. Introduction to Molecular Evolution and Bioinformatics (3 credits)
* MCB 4009. Structure and Function of Biological Macromolecules (3 credits)
* MCB 5011. Enzyme Structure and Function (3 credits)
* PNB 6420. Physiological Proteomics (3 credits)

### D. Genetics

* MCB 2400 or 2410. Genetics (3 credits)
* MCB 3201. Gene Expression (3 credits)
* MCB 3412. Genetic Engineering (3 credits)
* MCB 3413. Concepts of Genetic Analysis (4 credits)
* MCB 3602W. Introduction to Bioinformatic Tools for Microbial Genome Annotation (1 credit)
* MCB 3617. Molecular Biology and Genetics of Prokaryotes (4 credits)
* MCB 3637. Practical Methods in Microbial Genomics (3 credits)
* MCB 5429. Theory and Practice of High Throughput Sequence Analysis (2 credits)
* EEB 5300. Practical Genomics in Ecology and Evolution (3 credits)
* EEB 5348. Population Genetics (3 credits)

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### Additional Options

The following courses can count toward the 15-credit requirement if approved by a member of the Bioinformatics Oversight Committee:

* MCB 3895. Special Topics in Molecular and Cell Biology
* MCB 3899. Independent Study in Molecular and Cell Biology
* MCB 3989. Introduction to Research in Molecular and Cell Biology
* MCB 4989. Introduction to Honors Research in Molecular and Cell Biology
* EEB 3899. Independent Study
* EEB 5895. Investigations in Special Topics
* PNB 3299. Independent Study
* CSE 4095. Special Topics in Computer Science and Engineering
* CSE 4099. Independent Study in Computer Science and Engineering

## Completed Courses

Please list and sum credits for all courses taken at the 2000 level or higher.

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| Course Name | Number of Credits |
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Total credits

(Must be 15 or more with a grade of C or better.)

## Student and Committee Information

### For Students

Student Name

Student ID

Expected graduation

Phone

Email

### For Oversight Committee

* Contact for MCB: J. Peter Gogarten, (860) 486-4061
* Contact for CSE: Ion Mandoiu, (860) 486-3784

Signature indicates that the Committee member approves of the above plan of study for the minor bioinformatics.

Signature \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date \_\_\_\_\_\_\_\_\_\_\_

Department \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_