

# BIOINFORMATICS (BIOF)

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## Courses

### **BIOF-100 INTRODUCTION TO BIOINFORMATICS 3 Credits**

An introduction to bioinformatics as a scientific discipline. No prior knowledge needed. Emphasis is on the application of computational tools and techniques to solving Molecular Biology problems. Topics include: essential concepts in Molecular Biology, DNA sequencing methods, sequence alignment methods, sequence databases and web servers, regulatory sequence motif finding, sequence variation and phylogenetics. Pre-requisite: Placement into core MATH or above.

### **BIOF-301 COMPUTATIONAL GENOMICS 3 Credits**

Introduction to the current computational methods for whole genome sequence analysis. Emphasis is on large-scale sequence data analysis in a high-performance UNIX/Linux computing environment. Topics include, genome structure and organization, whole genome assembly and annotation, comparative genomics, transcriptome assembly and gene expression analysis, genome arithmetic, DNA polymorphism detection, and small RNA Biology and analysis. Pre-requisite: MATH-170 and CS-250, with a grade of C or better.

### **BIOF-350 IMAGE ANALYSIS 4 Credits**

Covers image processing techniques with application to biological images. This includes scanning technology, image segmentation, application of machine learning to image analysis, and development of automatic image analysis software. Programming experience is expected. Students will both use and develop image analysis software. Pre-requisite: MATH-170 and CS-250, with a grade of C or better.

### **BIOF-399 Research Assistantship 12 Credits**

Research Assistantship in Bioinformatics.

### **BIOF-495 PRACTICUM IN BIOINFORMATICS 1-12 Credits**