Master of Science in Bioinformatics

The University of Texas at El Paso offers a Master of Science in Bioinformatics, an interdisciplinary degree administered by the College of Science. This Professional Science Master's (PSM) Degree was launched in 2001 with a grant from the Sloan Foundation and the support of the Departments of Biological Sciences, Chemistry, Computer Science, and Mathematical Sciences. The program aims at producing graduates who are ready to serve as research, managerial, or technical professionals in various areas of bioinformatics. It is part of the national effort in developing PSM degrees to enhance our future economy through promoting innovations in science and technology.

What is Bioinformatics?

Bioinformatics focuses on the management and interpretation of biological information. It is the study whereby data acquired from complex biological phenomena are analyzed and modeled using sophisticated numerical methodologies. The availability of genomic sequence information from viruses to humans has created urgent needs for professionals who are able to decipher these sequences and give them meanings. The complexity of such an enormous amount of biological data requires efficient tools for their analysis and interpretation. Bioinformatics is the development and application of such tools based on mathematical models, statistical methods, and computational algorithms by well-trained professionals with broad scientific backgrounds.

Curriculum

The master's degree in bioinformatics at UTEP requires a total of 40 graduate credit hours of advanced courses in biology, biochemistry, computer science, mathematics, and statistics. The interdisciplinary curriculum is designed for students with diverse backgrounds to acquire knowledge and skills in a cooperative learning environment. Typically, a student completes this graduate degree in two years by taking a combination of bioinformatics core courses, general courses in disciplines outside of their undergraduate major, and advanced graduate courses in a specialized area of bioinformatics. With options for writing theses, conducting research projects, or training in management and entrepreneurship as part of the curriculum, students completing the program will function as pivotal members of an interdisciplinary team.

Internship

Before graduation, all students in this PSM program are required to gain practical working experience through an internship at an academic, industrial, or government institution. Host institutions for our students' internships in the past few years include the Joint Center for Structural Genomics at La Jolla, National Institutes of Health in Bethesda, Pittsburgh Supercomputing Center, and University of Wisconsin, among many others.

Facilities and Research Training

A network of Sun workstations is maintained at our Bioinformatics Computing Laboratory with connections to the IBM p590 at UTEP High Performance Computing and the CRAY XD-1 in the Department of Mathematical Sciences. DNA sequencing and microarray facilities are available in the Department of Biological Sciences. Students will gain experience in both computational and experimental approaches in bioinformatics research by working with faculty members on a variety of projects funded by government, state, and private agencies. Our research themes are:

- DNA sequence assembly and analysis
- ecology and phylogeny
- microarray and proteomics data analysis
- RNA and protein structure prediction.

Students also have opportunities to present their works at national and international conferences and publish research findings in scientific journals.

Career Opportunities

Bioinformatics professionals now play a critical role in a wide variety of biomedical research and biotechnology industries. Some of our recent graduates have joined the workforce in the biotechnology and software industries, while others have become laboratory managers and program analysts in prestigious research organizations. Employers of our recent graduates include:

- Broad Institute at MIT
- Maxygen
- National Cancer Institute
- ORACLE/PeopleSoft
- Washington University.

Tuition Costs and Financial Support

Texas resident graduate tuition is approximately $2000 per semester for 10 credit hours; non-resident tuition cost is $4800. Additional student fees may apply. Details on tuition and fees are published in the Class Schedule every semester. Depending on availability, a limited number of assistantships and scholarships are awarded each year on a competitive merit basis.

Program Contacts

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