M.S. in Bioinformatics

The Master of Science in Bioinformatics is a Professional Science Master's (PSM) degree designed with the concept of training science professionals as part of the national effort in developing PSM degrees to enhance our future economy through promoting innovations in science and technology. Bioinformatics is an interdisciplinary science that offers unique opportunities for individuals with diverse backgrounds to learn and collaborate with others. There is an increasing demand for well-trained bioinformatics professionals capable of developing computational tools integrated with experimentation for solving complex biological problems. In addition to required coursework, students attend the weekly bioinformatics colloquium series, with research seminars and professional training workshops, and complete an internship at a bioinformatics company or research institution. Training areas include genomics data analysis, molecular modeling, and online database development, preparing graduates for various technical fields in agriculture, biodiversity and environmental science, cancer research, drug design, genetic and infectious diseases, and health data management.

Admission Requirements

The following documents are required in the online application for admission to the Bioinformatics M.S. Program:

1. A completed Graduate School Application form.
2. Official copies of transcripts and GRE/TOEFL scores.
3. A statement of purpose summarizing professional goals.
4. At least two letters of recommendation.
5. Applicants from countries where English is not the first language are required to demonstrate English proficiency. Please consult the graduate school (http://catalog.utep.edu/admissions/graduate/graduate-student/) website for required scores

Prior to making a recommendation on acceptance to the Graduate School, the Bioinformatics Admissions Committee will review the academic preparation of applicants. Unconditional admission requires a completed bachelor's degree that includes satisfactory undergraduate coursework experiences in Biology, Chemistry, Computer Science, Mathematics, and Statistics. This foundation is represented by the following UTEP courses and their several underlying prerequisites (or by the equivalent experience at other institutions):

Code	Title	Hours
BIOL 3314	Molecular Cell Biology	3
CHEM 2324	Organic Chemistry	3
CS 2401	Elem. Data Struct./Algorithms	4
MATH 2300	Discrete Mathematics	3
STAT 2480	Elementary Statistical Methods	4

Course descriptions and prerequisites of these courses are provided in the UTEP *Undergraduate Catalog*. Because this suite of foundation courses is seldom met by traditional undergraduate curricula, potential applicants should make early inquiry of the Program Director for consultation on its expeditious completion.

Degree Requirements

The Master of Science degree in Bioinformatics consists of 40-41 graduate hours comprised of required courses and electives drawn from a restricted menu. The program of study is intended to be a course-intensive experience requiring two years of full-time academic work, including a summer internship in the public or private sector between the first and second years. The internship is required of all students in the program and it can be counted as a three-credit-hour elective course. A thesis is an option but not a requirement for this degree.

I. Internship

The student is responsible for securing an internship offer from an academic, industry, or government institution that is a current or potential employer of bioinformatics professionals. For the internship to count towards the Master of Science degree in Bioinformatics, the student must obtain pre-approval from the Bioinformatics Program Committee before the start of the internship. An evaluation form will be sent to the employer at the end of the internship and the student must receive a grade of "Satisfactory" or better in order to fulfill the internship requirement of this degree.

II. Courses

Thesis courses. Six (6) hours of thesis courses BINF 5398 and BINF 5399 can be taken in place of regular elective course to count towards the MS in Bioinformatics degree. All University requirements for master's theses apply.

A maximum of up to six (6) credit hours of approved advanced undergraduate courses in Biology, Chemistry, Computer Science, Mathematics, or Statistics. Only undergraduate courses which are listed as applicable towards graduate degrees by the Graduate School can be counted towards the MS in Bioinformatics degree (see *Graduate Catalog* listings under individual departments). Approval from the Graduate Advisor is required.

With the approval of the Bioinformatics Program Committee and the Graduate School, up to six (6) semester hours of graduate work can be transferred from another accredited institution to replace equivalent courses. Only credit hours that have not been counted towards a previously awarded degree are allowed to be transferred.

Degree Plan

Required Credits: 41

Code	Title	Hours
MS in Bioinformatics (All courses require a grade of C or better)		
Seminars		
Select four semesters from the following:		4
BINF 5110	Biology Seminar/Bioinformatics	
BINF 5111	Chem. Sem. for Bioinformatics	
BINF 5112	CS Seminar for Bioinformatics	
BINF 5113	Math Sem. for Bioinformatics	
Required Courses:		
BINF 5341	Anal./Model of Bio Structures	3
BINF 5351	Intro. Bioinformatics I	3
BINF 5352	Intro. Bioinformatics II	3
BINF 5354	Post-Genomic Analysis	3
BIOL 5340	Structure/Funct Macromolecules	3
CS 4342	Database Systems	3
STAT 5329	Statistical Programming	3
STAT 5428	Intro to Statistical Analysis	4
Internship:		
BINF 5353	Internship in Bioinformatics	3
Electives:		
Select three courses from the following:		9
BINF 5398	Thesis	
BINF 5399	Thesis	
BIOL 5302	Resrch Biological Science	
BIOL 5316	Biosystematics	
BIOL 5326	Advances Immunological Concept	
BIOL 5329	Physiology of Bacterial Cell	
BIOL 5344	Molecular Pathogenesis	
CHEM 5329	Contem Topics Organic Chemistr	
CHEM 5339	Contemp Topics in Biochemistry	
CHEM 5396	Graduate Research in Chemistry	
CS 5334	Parallel & Concurrent Program	
CS 5341	Advanced Computer Architecture	
CS 5350	Advanced Algorithms	
CS 5351	Interval Computations	
CS 5391	Individual Studies	
CS 5396	Graduate Projects	
CS 5397	Graduate Projects	
MATH 5330	Comp Methods of Linear Algebra	
MATH 5335	Techniques in Optimization	
MATH 5396	Graduate Research	
STAT 5336	Categorical Data Analysis	
STAT 5386	Stochastic Processes	
STAT 5388	Multivariate Data Analysis	
STAT 5391	Time Series Analysis	
STAT 5392	Statistical Computing	

STAT 5396	Graduate Research	
Total Hours		**41**

Program Director

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Professors

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