

# Genomics - Bioinformatics Emphasis, MS

## Program Description

The Master of Science in Genomics is designed to support workforce readiness and academic advancement. The program provides flexible pathways, including a 5-year BS/MS option for UT undergraduates to complete both bachelor's and master's degrees in five years, as well as a two-year track for external students. With emphases in Bioinformatics and Functional Genomics, the curriculum integrates computational skills, such as genomic data analysis and machine learning, with experimental techniques, including CRISPR/Cas9 gene editing and 3D organoid modeling, ensuring students are prepared for industry roles or further graduate studies.

Grounded in active, hands-on learning, the program emphasizes lab-based and project-driven experiences that foster practical skills critical for careers in the life sciences. Cross-training in both emphases ensures a comprehensive understanding of genomics by blending computational and experimental methodologies. This proposal exemplifies UT's commitment to innovation, accessibility, and excellence in education, advancing its polytechnic mission to meet the evolving demands of the workforce.

## Admissions Requirements

1. BS from a regionally accredited institution in Biology, Biochemistry, or a closely related field, or are on track to complete a BS within the next academic year.
2. Successful completion of the following courses (or equivalent at a local institution): A. Functional Genomics Emphasis.
3.
  - i. BIOL 3030 Principles of Genetics
  - ii. BIOL 3330 Cell Biology
  - iii. BIOL 4300 Molecular Bio
  - iv. CHEM 3510 Biochemistry I
 B. Bioinformatics Emphasis
  - i. BIOL 1610 Principles of Biology
  - ii. CS 1400 Fundamentals of Programming
  - iii. BIOL 3300 Intro to Bioinformatics
4. Cumulative GPA of 3.0 or higher.
5. Submit a personal statement of your career goals and why you feel this program will support your goals.
6. Submit Official transcripts
7. Submit Curriculum Vitae (CV).
8. Submit two (2) letters of support.
9. Submit a video interview discussing specific question prompts.

## Program Curriculum

### 30 Credit

Code	Title	Hours
<b>Required College-Level Prerequisite Courses</b>		
BIOL 1610	Principles of Biology I (LS)	4
CS 1400	Fundamentals of Programming	3
BIOL 3300	Introduction to Bioinformatics	3

### Program Required Courses

Code	Title	Hours
BIOL 5100/6100	Biomedical Research Ethics	1
BIOL 5330/6330	Genomics & Precision Medicine	3
BIOL 5320/6320	Scripting For Biologist	3
BIOL 5910/6910	Genomics Seminar I	1
BIOL 5920/6920	Genomics Seminar II	1
BIOL 6930	Research in Progress I	1
BIOL 6940	Research in Progress II	1

**Complete six (6) credits of Genomics Capstone**

BIOL 5900R/6900R	Genomics Capstone	1-3
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**Program Electives**

<b>Code</b>	<b>Title</b>	<b>Hours</b>
<b>Students must meet with their Advisor before registering for electives</b>		
BIOL 6990R	Directed Studies	1-3
BIOL 6105R	Genomics Lab Rotation	1-3

**Bioinformatics Emphasis Courses**

<b>Code</b>	<b>Title</b>	<b>Hours</b>
BIOL 5070/6070	AI & Machine Learning in Biology	3
BIOL 6010	Genomic Pipeline Optimization	3
BIOL 6040 & BIOL 6045	Multi-omics Data Analysis and Multi-omics Data Analysis Lab	4
BIOL 6130	Statistical Genomics	3
BIOL 6310	Bioinformatic Algorithms	3

**Graduation Requirements**

1. Complete the required 30-32 hours of coursework.
2. Earn a 3.0 or higher GPA for the entire program.
3. Receive no less than a B- in any of the program courses.