University of Colorado Anschutz Medical Campus

Anschutz

Biomedical Informatics, Modeling, and AI (PhD)

CU Anschutz · formerly Computational Bioscience (CPBS)

Training computational scientists for biomedicine's AI era.

Fully funded
Tuition, health and dental, $44,290/yr stipend

~5 years
In person, Denver area

4 tracks · 5 pathways
One degree; 4 specializations; and 5 pathways to make impact

Deadline: Dec 1
Applications for Fall 2027

WHAT THE NAME MEANS

INFORMATICS
Data foundation:
health data, genomics, imaging, clinical workflows

MODELING
Mechanistic understanding:
dynamics, neural circuits, physiological models fit to patient data

AI
Scalable intelligence:
foundation models, neural decoding, predictive deep learning

YOUR PATH

YEAR 1	YEAR 2	YEAR 3 +
• 4 core courses • 3 lab rotations • Writing and critique workshops • **Qualifying exam in June** • Join your lab by July 1	• 2 core courses • Specialization elective • **Research Studios** on real-world problems and datasets	• Comprehensive exam + pathway declaration • Dissertation research • **Required internship** • Defense

SIX-COURSE CORE

Fall 2027 entrants are the first cohort to take the full core at its target form from day one.

1 Math foundations
Y1 Fall · Read a methods paper, find its math, flag errors.

2 Biomedical and clinical foundations
Y1 Fall · Disease, neural systems, imaging physics, clinical reasoning.

3 ML and AI systems for biomedical discovery
Y1 Spring · Not using AI: verifying what it produces.

4 Computational foundations
Y1 Spring · Algorithms by hand, then real tools. Reproducible practice.

5 Statistical and causal reasoning
Y2 Fall · Confounding and defensible choices, on your own data.

6 Translational biomedical informatics
Y2 Fall · Deployment, regulation, equity, policy.

HOW TEACHING IS DIFFERENT

By hand first, then AI. Every new skill starts without AI assistance.

Defend your choices. Writing code with AI is assumed; defending every choice and result under questioning is the test.

Catch the flaw. You'll get AI-generated analyses with planted errors and be graded on what you find. AI use is always disclosed.

Signature exam (June, Year 1): a real dataset, papers with real flaws, and multiple AI outputs. Write a research strategy that includes plans for doing rigorous evaluation and exposing limitations & failure modes, then defend it live.

Find your track · Check your fit · Apply by Dec 1

BIMA PhD · CU Anschutz

FOUR SPECIALIZATIONS: WHAT YOU NEED

● *Expected (or equivalent proficiency)* ○ *Encouraged. Specialization coursework runs in Year 2.*

	Bioinformatics & Computational Biology	Computational Neuroscience	Imaging Informatics	Clinical Informatics
Year 2 anchor elective	Omics analysis, integration and prediction	Computational and theoretical neuroscience	Medical image analysis and computer vision	Clinical decision support and predictive modeling
Typical majors	Biology, genetics, bioinformatics, CS, math/stats, engineering	Neuroscience, CS, math/stats, physics, engineering, biology	CS, biomedical or electrical engineering, physics, math/stats, data science	CS, health informatics, data science, stats, public health; clinical degrees
EXPECTED				
Calculus I and II	●	●	●	●
Probability and statistics	●	●	●	●
Programming	●	●	●	●
Linear algebra	○	○	●	●
Domain foundation	Molecular biology, genetics, or genomics	Neuroscience, biology, physics, or engineering	n/a	n/a
ENCOURAGED				
Also helpful	Bioinformatics, genetics and genomics	Calculus III, differential equations, algorithms, ML, modeling	Calculus III, signal processing, computer vision	Calculus III
Experience that helps	Genomic, single-cell, proteomic, or other high-dimensional data	Neural data, signal processing, dynamical systems, decoding	Medical imaging, computer vision, deep learning	EHR data, predictive modeling, decision support, digital health

You can also define your own specialization, building on the existing ones.

NOT AN EXACT MATCH?

Equivalent preparation counts: advanced coursework, research, or professional experience.

Small gaps are workable: strong applicants may take extra coursework before matriculation or early in the program.

Nontraditional backgrounds are encouraged. Bachelor's or higher (minimum 3.0 GPA) in a quantitative, computational, or biomedical field.

FIVE DISSERTATION PATHWAYS: SAME RIGOR, DIFFERENT EVIDENCE

Pick one (or two) at your Year 3 comprehensive exam.

Scientific discovery
Publications and their contribution

Methods innovation
A benchmarked method or validated system

Clinical translation
A deployed prototype with outcome evidence

Entrepreneurship
Venture validation (I-Corps)

Open science
Early adoption and usage of what you built

*In the application portal, if you see **Computational Bioscience (PhD)**, please select it; it is the same program.*

HOW TO APPLY

cuanschutz.edu/graduate-programs/biomedical-informatics-modeling-and-ai/admissions

DEADLINE: TUESDAY, DEC 1

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