

Advanced Application of Bioinformatics / Application of AI in Bioinformatics.

This special topic course is designed for students who have taken GMS6014 and want more hands-on experience in applying bioinformatics and computational approaches to solve real research problems. Starting in spring 2026, the course will focus on “Application of AI in Bioinformatics”. It will discuss the following:

- How to use AI to support routine bioinformatics tasks such as omics data analysis? What are the caveats?
- What are AI agents? How will they impact bioinformatics research?
- The impact of domain-specific models such as ESM and AlphaGenome on biomedical research.

Students taking this course are expected to take a bioinformatics project pertinent to their research work and develop it over the 10 weeks (modules 1-2, spring 2026). There will be two types of class meetings. The **lectures** will focus on specific topics. The **discussion sessions** will explore resources, strategies, planning, and development of student-initiated projects in a peer-learning environment.

Unlike GMS6014, basic programming knowledge (e.g., a college-level programming fundamentals course or prior experience writing scripts and Python programs) is required. Classes will meet once a week, beginning on Tuesday, Jan 13th, 2026, at CGRC-291. The meeting schedule for the following weeks will be determined at the first meeting.

Course Director:

Dr. Lei Zhou (leizhou@ufl.edu)

Date	Location	TOPIC	
		Concept	Practice
Week 1 (1/16)	CGRC- 291	Intro and general planning	Objectives and background of projects.
Week 2 (1/20)	CGRC- 291	Basis of AI (NN, LLM)	Objectives and background of projects.
Week 3 (1/28)	CGRC- 291	Inference and prompt. Work environment with HiPerGator.	Project Planning
Week 4 (2/4)	CGRC- 351	DNA and Protein Encoding.	Neural network modeling demo
Week 5 (2/11)	CGRC- 291	AlphaGenome and genomic models	Project discussion (progress and problems)
Week 6 (2/18)	CGRC- 351	Intro to AI Agents	AI Agentic analysis
Week 7 (2/25)	CGRC- 291	Project discussion (progress and problems)	
Week 8 (3/4)	CGRC- 291	Troubleshooting session	
Week 9 (3/11)	CGRC- 351	Final progress report	