

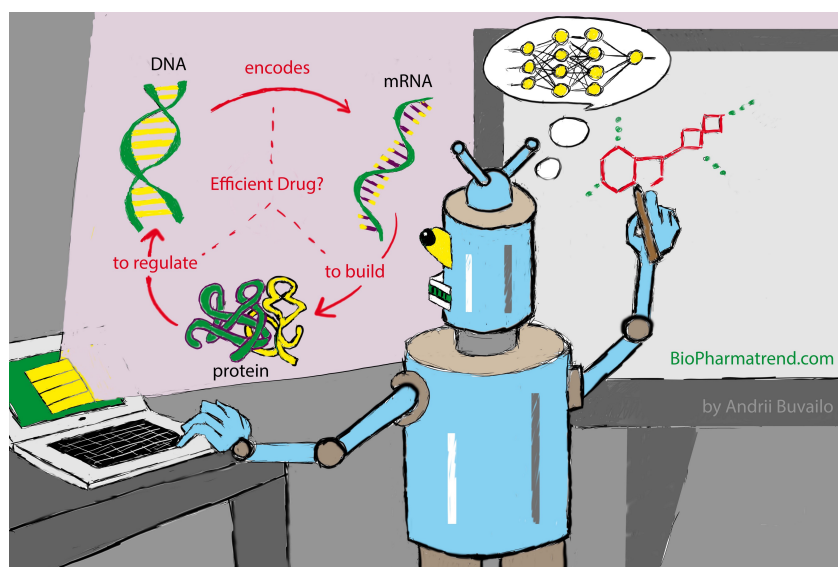
# Algorithms in Structural Bioinformatics

Time: TR 3:55pm-5:10pm

Location: ZACH 361

Instructor: Yang Shen ([yshen@tamu.edu](mailto:yshen@tamu.edu))

[Shen-Lab.github.io](http://Shen-Lab.github.io)



Graph Neural Networks  
Attention Mechanisms  
**Optimization**  
**Machine Learning**  
Mathematical Modeling  
Algorithmic Thinking  
Health Care <sup>Phenotype</sup>  
Function **Drug** Interpretability  
**Protein**  
Structure **Data**  
Sequence  
**Artificial Intelligence**  
**Biological Intelligence**  
**Deep Learning**  
Convolutional Neural Networks  
**Neural Networks**  
Recurrent Neural Networks

## Course Description:

This course introduces **fundamental concepts, modeling techniques, and computational algorithms in structural bioinformatics** especially for students interested in algorithms and data science. Through fostering algorithmic thinking and problem-solving skills, it aims at preparing students for computational challenges arising from the data-rich field as well as career opportunities in the surging healthcare AI industries.

With a **focus on algorithms including optimization and learning**, the course provides essential knowledge for students without prior background in the application domain.

**Application topics** include protein sequence, structure, and function; drug discovery; genotype-phenotype association; and biomolecular systems engineering.

## Prerequisites:

Basic knowledge in algorithms and programming. No prior knowledge in biomolecules or biomolecular systems is required. In the past 5 offerings, 7 undergraduate and 56 graduate students from 6 departments in 3 colleges have participated, leading to 50 course projects.