

CHBE 4803 Syllabus

Special Topics: AI for Chemical Engineering Experimentalists, Section VJ, 3 credit hours

Fall 2026

Instructor Information

Instructor: Vida Jamali

General Course Information

Description

Fundamental understanding and application of AI to experimental data relevant to chemical engineers

Course Learning Outcomes

By the end of this course, a student should be able to:

1. Have a good understanding of how AI models operate, explain the principles behind relevant AI models, and understand their application in analyzing experimental data
2. Be able to apply AI models to experimental data: gain hands-on experience in applying AI models to various types of experimental data in chemical engineering, including microscopy, spectroscopy, synthesis, biomolecular engineering, and electrochemistry
3. Be able to select a model and implement it: students will be able to assess which type of AI model is suitable for their data
4. Have a mathematical understanding of the AI models: this includes loss function, optimization, and regularization
5. Be able to evaluate the performance of the model: students will learn the relevant tests and statistical methods to evaluate the performance of AI models and how to report the results
6. Be able to communicate their results and present them to their peers

Required Course Materials

Simon Prince, Understanding Deep Learning

Grading Policy:

In this course the following graded assessments and assignments are used to determine the course grade:

| | |
|----------------------------|------|
| Homework | 40% |
| Midterm Exam | 20% |
| Student Paper Presentation | 10 % |
| Final Project | 30% |

The letter grade cutoffs in this class are 90%+ for A, 80%+ for B, 70%+ for C, 60%+ for D, based on the overall score based on the relative weights above.

Course Policies

Attendance and/or Participation

Your academic success will depend strongly on the level of engagement with the course material. Actively participating in all lectures and taking advantage of other learning opportunities offered (e.g. assignments, office hours) is critical for successful attainment of the learning outcomes. The Georgia Tech Catalog describes policies around “approved Institute activities” (e.g., field trips and athletic events) and accommodations around religious observances.

Academic Integrity

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. Review [Georgia Tech’s Honor Code](#) and the student [Code of Conduct](#).

Cases of suspected cheating or plagiarism on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations.

Core IMPACTS

Not applicable for this course.

Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, [contact the Office of Disability Services](#) (404-894-2563) as soon as possible to make an appointment

to discuss your special needs and to obtain an accommodations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs.

Student-Faculty Expectations Agreement

At Georgia Tech, we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. [The Student-Faculty Expectations](#) articulate some basic expectations that you can have of me and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, I encourage you to remain committed to the ideals of Georgia Tech while in this class.