

CSC 352 / CSC 552: Generative AI

Generative AI

Quinnipiac University

Fall 2026 · 3 Credits · T/Th 3:30-4:45 PM, CCE 030

Course Code: CSC35201_26/FA / CSC55201_26/FA

Field	Detail
Format	In-person. Tuesday and Thursday, 3:30-4:45 PM, CCE 030. One combined lecture for both sections.
Materials	Course materials are on Canvas and the course website. Live links are on Canvas.
Term	Fall 2026

Instructor Information

Instructor Ron (Rongyu) Lin

Contact rongyu.lin@quinnipiac.edu

Office CCE 233

Office hours are shared across CSC 150, CSC 352 / CSC 552, and INF 605. Students from any of those courses are welcome.

- Tuesday 2:00-3:00 PM, CCE 233 and Zoom (in person or online)
- Wednesday 11:00 AM-12:00 PM, CCE 233 and Zoom (in person or online)
- Thursday 1:00-2:00 PM, CCE 233 and Zoom (in person or online)
- Friday 11:00 AM-12:00 PM, Zoom only

To meet during office hours, book an appointment from Canvas, then join Zoom or come to CCE 233. Live booking and Zoom links are on Canvas.

CSC 352 and CSC 552 share the same lectures, classroom, and Canvas course.

1 Course Description

This course is a hands-on study of generative AI. Students implement core language-model components from scratch, including tokenization, attention, GPT-style architecture, training, and fine-tuning, using Sebastian Raschka's *Build a Large Language Model (From Scratch)*. Later meetings cover prompting, retrieval, vision-language models, tool use, and coding-agent case studies, plus a team project.

1.1 Learning Objectives

- Implement the core of an LLM from scratch (tokenization, attention, GPT-style architecture, training, and fine-tuning)
- Explain how pre-training, instruction fine-tuning, and LoRA change what a model can do
- Design prompts, including chain-of-thought, and evaluate their effect
- Build a RAG pipeline that retrieves evidence and conditions generation on it
- Use function calling and an agent loop, including MCP, skills, and hooks
- Read production coding-agent systems at a course level
- Complete a team project

2 Sections

Field	CSC 352	CSC 552
Catalog / section	CSC*352-01	CSC*552-01
Meetings	T/Th 3:30-4:45 PM, CCE 030	T/Th 3:30-4:45 PM, CCE 030

Monday holidays do not cancel this Tuesday/Thursday class. There is no class during Thanksgiving week.

3 Course Structure

Meetings: Tuesday and Thursday, 3:30-4:45 PM, CCE 030. This schedule is subject to change.

Assignment 1 is due Sunday of week 3, 11:59 PM ET. Later assignments follow every three weeks, each due Sunday of that week. Live due dates are on Canvas.

Week	Session	Title
Week 1	Overview	Course introduction and expectations
Week 1	Lecture 1	Machine Learning Foundations
Week 2	Lecture 2	PyTorch tensors and autograd
Week 2	Lecture 3	PyTorch networks and training
Week 3	Lecture 4	Tokenization
Week 3	Lecture 5	Embeddings and data sampling
Week 4	Lecture 6	Attention and Transformer Basics
Week 4	Lecture 7	Causal and multi-head attention
Week 5	Lecture 8	Building GPT Architecture
Week 5	Lecture 9	GPT implementation
Week 6	Lecture 10	Model Training Pipeline
Week 6	Lecture 11	Training pipeline practice
Week 7	Lecture 12	Fine-tuning for Classification
Week 7	Lecture 13	Classification fine-tuning practice
Week 8	Lecture 14	Instruction Fine-tuning
Week 8	Lecture 15	Parameter-efficient fine-tuning / LoRA
Week 9	Lecture 16	Systematic prompting
Week 9	Lecture 17	Chain-of-Thought and inference-time compute
Week 10	Lecture 18	RAG
Week 10	Lecture 19	Vision-language models
Week 11	Lecture 20	Function calling and the agent loop
Week 11	Lecture 21	MCP, skills, and hooks
Week 12	Lecture 22	Loop engineering and graph engineering
Week 12	Lecture 23	Case study: Claude Code
Week 13	Lecture 24	Case study: Grok Build
Week 13	Lecture 25	Final project kickoff
Week 14	No class	Thanksgiving recess
Week 15	Lecture 26	Final project work session
Week 15	Lecture 27	Project presentations / wrap-up

4 Required Materials

Required textbook. Sebastian Raschka, *Build a Large Language Model (From Scratch)*. This is the only required purchased book.

Additional materials (posted on Canvas as needed):

- Prompt Engineering Guide
- Model Context Protocol documentation and the official Python SDK
- Course notes and assigned articles posted on Canvas

Live links are on Canvas.

5 Grading and Assessment

Component	Weight	Description
Assignment 1	10%	Homework notebook
Assignment 2	12%	Homework notebook
Assignment 3	12%	Homework notebook
Assignment 4	8%	Homework notebook
Assignment 5	8%	Homework notebook
Final project	40%	Team project
Attendance and participation	10%	Lectures and in-class activities
Course total	100%	

Extra credit, if offered, can add up to 3 percentage points on the course total. Assignment details are posted with each assignment.

5.1 Grading Scale

A (90-100) B (80-89) C (70-79) D (60-69) F (< 60). Pluses and minuses are at instructor discretion.

6 Course Policies

6.1 Attendance and Participation

The course meets in regularly scheduled sessions. Consistent presence is essential. In-class activities and discussions count toward the grade. If you miss a class, email the instructor in advance to arrange make-up work.

6.2 Late Work

Assignments are due Sunday of the due week, 11:59 PM ET, unless Canvas says otherwise. Late work loses 10% per day for the first 5 days. After 5 days the maximum score is 50%.

6.3 Academic Integrity

Students are expected to maintain the highest standards of academic integrity. Cheating, plagiarism, and academic dishonesty, including unauthorized use of ChatGPT or other AI tools, are prohibited. Use of AI tools is permitted only when explicitly authorized for that assignment.

6.4 Accessibility

Students who require accommodation for a disability should contact the Office of Student Accessibility. Provide your accommodation letter early in the semester.

This syllabus is subject to change.