UNIVERSITY OF OREGON

Preparing CS Majors for the AI Era

The field of computer science is evolving rapidly with artificial intelligence. Computer science educators are responding in different ways; this document describes the approach being employed by the Department of Computer Science at the University of Oregon for its majors (CS/CYBR/MACS).

We are updating both what we teach and how we teach it. This document focuses on these changes, but our core commitment remains the same: ensuring our majors graduate with the strong foundational knowledge that has always defined our program. What's new is how we are adapting our approach to apply those foundations in an AI-enabled world.

Changes in What We Teach

First, we are updating our curriculum to include opportunities for AI-assisted software development. Industry is increasingly using AI tools for software development, and our students should be exposed to this approach. Fall 2025 saw a revised CS322 course showing how AI can be a multiplier for software development, starting without AI, then using AI for pair programming, and ultimately managing AI to write programs. Senior-level courses, like Fall 2025's CS422 (Software Engineering) and CS441 (Computer Graphics) and Winter 2026's CS410 (Entrepreneurship in CS), have also embraced AI-assisted software development in significant ways. Starting in Academic Year 26-27, we're bringing two courses from our CIT sequence into CS to give our students more chances to build software using AI.

Second, we are strengthening our program in high-demand areas. We recently launched a Cybersecurity major, and established a regional hub for cybersecurity research and education (learn more here). Our AI faculty — experts in adversarial machine learning, natural language processing, safety and security using AI, and data mining — are developing new courses on emerging topics. We also have faculty bridging AI to other areas of computer science, including a new course Winter 2026 term on AI for network and security operations, and a planned high-performance computing class in academic year 26-27 on ways to make AI usage more efficient and environmentally sustainable.

Changes in How We Teach

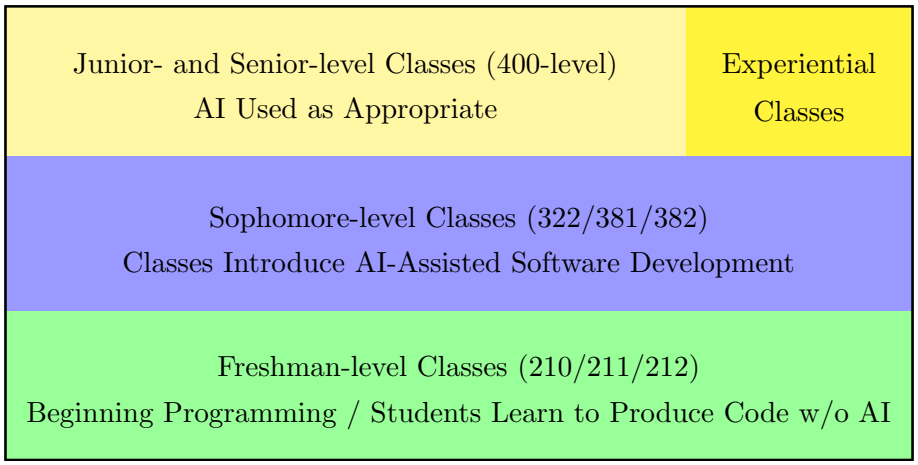
Experiential learning is a major focus for our department. We're expanding small, mentorship-intensive courses that deemphasize traditional lectures and instead focus on real projects with faculty guidance. Our capstone class in Winter 2025 exemplifies this approach. This course brought projects from Intel, Pacific Northwest National Laboratory, and Pipeworks (a local gaming company). Students worked in small teams tackling projects for ten weeks. Students met with faculty multiple times a week, and with industry sponsors every other week. The capstone class will be offered regularly going forward, complemented by additional offerings, like our Winter 2026 Entrepreneurship class and a Spring 2026 class where students will work on an open source C++ codebase of over one million lines of code. Finally, Winter 2026 has seen the introduction of our

"TSOC" class (Teaching Security Operations Center), where cybersecurity professionals mentor our students in real-world cybersecurity operations, akin to the model of a teaching hospital.

While large language models (LLMs) have the potential to support learning, they also have the potential to short-circuit that learning by doing too much thinking for students. Our faculty are adapting their class designs to make sure students have significant learning. In fact, our faculty voted unanimously that we should update all classes with AI in mind. In some cases, this means additional assessments (paper, coding demos), and in other cases new ways of learning where LLMs are a key part of the learning process. Our Graphics class in Fall '25 term had a mix of approaches: four-hour AI-free coding labs in the first half, then LLM-assisted portfolio projects in the second half.

Finally, we recognize some students are less eager to embrace AI, due to ethical concerns or to possible effects on learning foundational material. We are structuring many of our classes around both AI and non-AI pathways. Returning to the example of our graphics class, students had the choice of doing portfolio projects without AI as well.

Putting It All Together



This figure shows the plan for how the CS major unfolds, with each phase building on the last. In year one, the learning outcomes are the same as they have always been, i.e., students learn the basic building blocks backwards and forwards. While students will use AI to do on-the-fly learning throughout their careers, they need to have fully internalized concepts like variables, if-then-else, for loops, etc. In year two, students get exposed to AI-assisted software development. In years three and four, coursework adapts as appropriate to the subject matter, sometimes incorporating AI, sometimes not. During these years, students also take experiential learning courses where they build portfolio projects and develop practical skills through mentorship-intensive experiences.