Coursework

CS/ENGRI 172 is a freshman-level, rigorous, non-programming course: while programming skills are an essential part of a computer science education (and other engineering and scientific disciplines), computer science itself encompasses much more. Indeed, AI, our particular focus of study, draws on many fields, including linguistics, mathematics, philosophy, and psychology.

Since there is no programming assumed and no programming done, this class is not a substitute for CS99 or for CS100, as mentioned in the Course Information handout. Still, the coursework will be challenging, technical, and often mathematical in outlook. We will be covering material ranging from classic introductory AI topics to very recent research results (this is why there is no textbook). To try to give you an idea of what the homeworks will be like, here is an excerpt of a sample question. Naturally, you aren’t expected to understand the problem or even the notation; the intent is simply to convey the kind of assignments to expect.

*(Sample problem)* Recall from lecture that a perceptron with fixed weight vector \( \overline{w} \) and threshold \( T \) outputs 1 if \( \overline{w} \cdot \overline{x} \geq T \), and outputs 0 otherwise. Define a surpetron as being like a perceptron in that it has a fixed weight vector \( \overline{w} \) and threshold \( T \), but it outputs 1 if \( |\overline{w} \cdot \overline{x}| \geq T \), and outputs 0 otherwise. Explain how, given any surpetron, one can construct a small network of perceptrons that computes exactly the same function as the surpetron.

Enrollment Policy

The official policy is that the course is not open to those who have CS100-level experience. I first discuss the rationale, and then discuss the possibility of exceptions.

This course is intended to serve as an introduction to computer science with a focus on artificial intelligence. It is therefore clearly not appropriate for you if you already have experience with computer science: the course will not serve your needs well, and the learning environment for students without such experience may be degraded (for example, if questions are being asked in class that the other students do not have the background to understand). The course information handout and the website suggest other classes that would be more appropriate and have some overlap with the material we will cover.

That being said, having some programming background is not necessarily the same as having CS background. Furthermore, having programming experience may not convey any advantage. Hence, exceptions may be permitted on a case-by-case basis. This decision will be based partly on the results of the survey passed out in class today, which will help me gauge the average level of experience among all students, and partly on each individual situations. Hence, if you have placed out of CS100 and would still like to take the course, you must see me today — arrive at 4:30 at my office, 4152 Upson. (The doors lock soon after that. If you absolutely can’t make that time, arrange an appointment with me at the end of class.) During these individual meetings, we will discuss your situation and your options.

(over)
Some student questions

Q: Why is calculus required (and how much)?
A: For the most part, the course will be self-contained, which is why there aren’t many prerequisites. As mentioned above, we’ll be covering recent research results, and some of these involve some interesting connections between computer science and statistical physics; indeed, some of my own research has drawn on such connections. To understand these results, comfort with taking derivatives is needed, but we don’t have time in the class to introduce differential calculus.

Q: Who are the other people listed on the course information handout as part of the course staff?
A: They are teaching assistants. Once everyone’s schedules get settled, I will introduce them to you and announce their office hours.

Q: What if I find myself really interested in this material and eventually want to think about doing research?