Department of Philosophy

Phil 365: Philosophy of computing — *Katalin Bimbo*

[Course description — Winter term (2027)]

Nowadays, computers are *ubiquitous*, and computation plays an *essential role* in practically all areas of human activities. The course will focus on questions that arose (or became more salient) since the emergence of *electronic computers* in the middle of the 20th century. As we progress through the course, you will encounter concepts and problems that may be hinted at by phrases such as "information security," "complexity," "quantum computing," "digital identity" and "human–computer interaction."

We will start with asking what computers, computing, information and programs are. Then we will proceed to look at some *models of computation* and how they delineate what is *computable* (and what is not). The most widely known model is Turing machines, which still have a certain theoretical interest despite being practically inapplicable. Some models that we might glimpse at will include — beyond Turing machines — cellular automata, elementary formal systems, abacus machines, recursive functions and combinators. The sheer diversity of these models should instigate the idea that giving informal descriptions of computing is a thorny undertaking. Philosophers speculated about thinking machines for centuries. After the invention of fast, electronic, digital computers in the middle of the 20th century, *artificial intelligence* (AI) was born in 1956. We will dwell on various approaches to AI and the results they produced. It is natural to wonder about the relationship between *artificial intelligence* and *human intelligence*, and we will contemplate this relationship.

In the last part of the course, we will turn to questions such as "What is big data?," "What is information privacy?," "Are some algorithms better and faster than some others?," "How does public key cryptography work?" and "How do quantum computers fare compared to digital computers?". There are many other interesting problems in the vicinity of computing, especially, in view of the recent development of the computer programs producing predictive output based on large-scale databases. We might touch upon questions such as "Who does own the data?," "Who does select which data is used?" and "Are there or should there be restrictions on potential outputs these programs produce?". However, we will not have time to deal with all the questions that arise in connection to the current "AI boom." A primary goal of the course is to give you an understanding of the *concept of computing*, as well as of the *theory of computing* together with their *philosophical aspects*.

[There is *no official prerequisite* for this course and *no programming experience* is required. However, interest in computers, in philosophy, in mathematics and in informatics might be advantageous and it might facilitate your success in this course.]

Time: T, R 14:00 pm–15:20 pm

Readings and additional texts will be linked in the canvas class.

For *further information*, please contact the instructor at <bimbo@ualberta.ca>.
The (official) **course outline** will be available in the canvas class during the course.