

COURSE DESCRIPTIONS 科目簡介

COURSES FOR 4-YEAR UNDERGRADUATE PROGRAMMES

PAI3001 Data Analysis for the Humanities

(Prerequisite: PAI3003 Programming for the Humanities)

This course is intended for humanities students who are interested in learning about the fundamentals of programming, data analysis, and artificial intelligence. It provides an introduction to various types of mathematical functions, different kinds of data, and methods of data analysis, as well as the theoretical underpinnings of statistical analysis. The course places particular emphasis on the philosophy of probability and statistics, covering key topics such as interpretations of probability, the debate between Bayesianism and Frequentism, and the role of non-epistemic values in hypothesis testing and model selection. Through this course, students will gain a comprehensive understanding of how these concepts apply to real-world scenarios, enhancing their analytical skills.

PAI3002 Ethics and Artificial Intelligence

As Artificial Intelligence (AI) technologies continue to advance and become increasingly integrated into our daily lives, ethical questions surrounding AI are more pressing than ever. This course offers an introduction to the ethics of AI. It illustrates various ethical theories (e.g., Deontology, Consequentialism, etc.) that are useful for addressing practical issues arising from the use of AI technologies. Additionally, the course discusses a range of practical issues caused or potentially exacerbated by the widespread adoption of AI in society. Topics will cover current concerns, such as self-driving cars, deep fakes, etc., as well as future challenges related to superintelligent AI systems and existential risks.

PAI3003 Programming for the Humanities (3 credits)

This course is intended for humanities majors interested in learning about computer programming and the basics of artificial intelligence, with an emphasis on applications to topics in digital humanities, such as writing simple programs to help you analyze data sources (e.g. quantitative or text-based data) that enhance overall critical thinking skills. Through a sequence of coding exercises in the programming language Python, students will learn the fundamentals of algorithms and philosophical logic. Skills learned will be applicable to real-life tasks and future academic studies.

PAI4001 AI Ethics and Social Policy (3 credits)

The rapid advancement of AI technology poses novel and serious ethical challenges to society. These challenges must be addressed in part through rules and regulations laid down by governments and other policy-makers. But what sorts of policies are appropriate to deal with the challenges posed by AI? Which members of society should be empowered to make these decisions? What values should AI regulation aim to promote? In this course, we draw on resources from ethical and political philosophy and value theory to provide students with the philosophical tools necessary to evaluate and formulate policies to address the risks posed by emerging AI systems. Depending on the availability of partner agencies, Service-Learning will be implemented in the course. When implemented, students will have the option to participate in the Service-Learning activity or to complete the course through traditional teaching and learning methods.

PAI4002 Consciousness, Creativity, and Computation (3 credits)

Artificial intelligence research has produced computers that perform reasoning tasks, learn, formulate plans, classify data, and interact via natural language. Many have argued on this basis that extant computers already count as thinking agents, employing at least rudimentary versions of mental states like belief and intention. In contrast, it remains

acutely controversial whether there is any prospect whatsoever for a computational system that exhibits the mental capacities regarded as most characteristic of human mentality. Does the nature of computation permit or forbid a computational system that is conscious, or genuinely creative, or artistic, or capable of guilt or love, or free, or a moral agent on par with a human being? Are questions along this line even susceptible to rational inquiry, or are they unanswerable? These issues exist at the frontier of philosophy and science, interacting with lively debates on how best to characterize, theorize, and study the mental capacities in question. The aim of this course is to familiarize students with such debates and their implications for AI research, with a focus on the philosophical perspective. The course covers three interacting core topics: (i) the fundamental nature of computational systems and their physical implementation; (ii) the nature of consciousness, with a focus on the possibility of conscious AI systems; and (iii) the nature and value of creativity, with a focus on the possibility of significantly creative AI systems. Supplementary possible topics include: AI emotion; AI art; AI free will; AI selfhood; AI rights; AI personhood.

PAI4003 Philosophy of Machine Learning (3 credits)

Machine learning (ML) is indispensable to the field of Artificial Intelligence (AI), enabling the development of systems that can learn, adapt, and make intelligent decisions. Various MLbased products have been significantly integrated into our daily lives (e.g., ChatGPT, selfdriving cars, recommendation systems, etc.), leading to their increasing societal impacts. To critically evaluate the social impacts and address the relevant issues, it is important to understand the fundamental concepts and techniques of ML. This course provides an introduction to these essential concepts and techniques. Additionally, it discusses various philosophical issues related to ML, including debates surrounding the limitations of ML methods and the ethical implications of applying ML technologies.