

Artificial Intelligence (A I)

A I 380E Ethics in Artificial Intelligence 3 Hours

Examine important responsibilities and ethical challenges faced by an AI professional. Identify design decisions with ethical implications and consider the perspectives of users and other stakeholders when making ethically significant design decisions.

A I 380H Artificial Intelligence in Healthcare 3 Hours

Explore health IT systems, ranging from data semantics, data interoperability, diagnosis code, to workflow in clinical decision support systems. Discuss how AI innovations are transforming healthcare systems by focusing on AI in drug discovery, AI in medical image diagnosis, explainable AI for health risk prediction, and ethics of AI in healthcare.

A I 388 Natural Language Processing 3 Hours

Explore computational methods for syntactic and semantic analysis of structures representing meanings of natural language; study of current natural language processing systems; methods for computing outlines and discourse structures of descriptive text.

A I 388J Optimization 3 Hours

Explore the background on convex sets and functions, linear programming, convex programming, and iterative first-order and second-order methods.

A I 388K Online Learning and Optimization 3 Hours

Explore algorithms for convex optimization and algorithms for online learning. Focus on algorithms for large scale convex optimization. Discuss problems in machine learning. Apply these ideas to online learning.

A I 388U Planning, Search, and Reasoning Under Uncertainty 3 Hours

Introduction to three key foundational problems in AI: planning, search, and reasoning under uncertainty. Investigate how to define planning domains, including representations for world states and actions, covering both symbolic and path planning. Study algorithms to efficiently find valid plans with or without optimality, and partially ordered, or fully specified solutions.

A I 389L Automated Logical Reasoning 3 Hours

Explore automated reasoning techniques for propositional logic, first-order logic, linear arithmetic over reals and integers, theory of uninterpreted functions, and combinations of these theories. Examine automated logical reasoning both from a theoretical and practical perspective, including building useful tools, such as SAT and SMT solvers.

A I 391L Machine Learning 3 Hours

Explore computing systems that automatically improve their performance with experience, including various approaches to inductive classification such as version space, decision tree, rule-based, neural network, Bayesian, and instance-based methods; as well as computational learning theory, explanation-based learning, and knowledge refinement.

A I 391M Case Studies in Machine Learning 3 Hours

Explore major concepts, techniques, algorithms, and applications in machine learning. Evaluate machine learning methods and discuss practical case studies to produce solutions for real-world data analysis problems.

A I 394D Deep Learning 3 Hours

Explore the basic building blocks and intuitions behind designing, training, tuning, and monitoring of deep networks. Examine both the theory of deep learning, as well as hands-on implementation sessions in pytorch. Explore a series of application areas of deep networks in: computer vision, sequence modeling in natural language processing, deep reinforcement learning, generative modeling, and adversarial learning.

A I 394R Reinforcement Learning: Theory and Practice 3 Hours

Introduction to the theory and practice of modern reinforcement learning, with emphasis on temporal difference learning algorithms.

A I 395T Topics in Artificial Intelligence 3 Hours

A I 698 Thesis 6 Hours