

ARTIFICIAL INTELLIGENCE (AAIN)

AAIN1000 INTRODUCTION TO AI

This course introduces students to the interdisciplinary field of applied artificial intelligence and the professional domains they will encounter in the program. Students explore the fundamentals of AI technologies, their societal and ethical implications, and career pathways in each domain. Through lectures, guest speakers, guided discussions, and hands-on activities, students develop foundational AI literacy and select their domain by semester's end. (4 credits) fall

AAIN3001 FOUNDATIONS OF AGENTIC PROMPT ENGINEERING

This course introduces students to the emerging field of agentic prompt engineering, focusing on how prompts can drive generative and autonomous AI systems. Students learn to design, test, and iterate prompts for creative, visual, audio, and code-generating models, while building agentic workflows that chain multiple models and tools together. Through hands-on activities, homework assignments, and projects, students explore multimodal prompt design and develop intelligent agents that can plan, reason, and act. The course emphasizes ethical practices and responsible AI design, with projects reflecting real-world applications such as AI design assistants, virtual characters, educational bots, and automated creativity tools. **Prerequisite:** COMP1000 (4 credits) fall, spring, summer

AAIN4080 AGENTIC AI AND INTELLIGENT AGENTS

In this course, students explore the principles and real-world applications of agentic artificial intelligence (AI) and intelligent agents. They learn fundamental concepts such as agent architectures, reinforcement learning, planning, and multi-agent systems, and examine how large language models can be integrated into autonomous agents. Through hands-on projects, students design, implement, and evaluate intelligent agents capable of solving tasks and interacting in dynamic environments. Students also consider the ethical and societal implications of agentic AI and intelligent agents. **Prerequisites:** COMP1050 or COMP3125 (4 credits) fall, spring

AAIN5500 SENIOR PROJECT

In this course, students work in small teams to design, implement, evaluate, and communicate an AI/data-insightful solution to a complex, domain-informed problem. While work is team-based, each student must produce original, individually assessable artifacts demonstrating personal mastery. Domain knowledge is acquired through a domain brief, domain-mentor consultations and stakeholder interviews, and targeted readings. (4 credit) summer

AAIN5720 TRUSTWORTHY GENERATIVE AI

This course covers the landscape of adversarial attacks on generative AI and their implications for security and privacy. Combining foundational research with cutting-edge developments, students explore key themes in security, robustness, and alignment, tracing their roots from classical machine learning theory to modern large-scale models. Emphasis is placed on understanding not just what methods succeed or fail, but why, fostering the analytical skills needed to evaluate current defenses and craft principled, trustworthy AI systems. The course also covers mitigation techniques and the real-world challenges of securing generative AI deployments. (3 credits) fall

AAIN7001 FOUNDATIONS OF ARTIFICIAL INTELLIGENCE

This course provides a rigorous introduction to the core principles, methods, and architectures that underlie modern artificial intelligence. Students explore fundamental topics in intelligent behavior, search and optimization, knowledge representation, reasoning, planning, and learning. The course bridges foundational symbolic approaches with contemporary probabilistic and data-driven methods, emphasizing how these techniques enable intelligent perception, decision-making, and action in both agents and systems. Through programming assignments and conceptual analysis, students develop computational foundations behind current and emerging AI applications. (3 credits) fall, spring, summer

AAIN7410 AGENTIC AI SYSTEMS

This course offers an in-depth exploration of topics in agentic artificial intelligence (AI) systems. Students critically examine contemporary research on cognitive and reactive agent architectures, multi-agent reinforcement learning, neuro-symbolic and hybrid agents, integration of large language models into autonomous agents, evaluation methodologies, and ethical considerations. Through a combination of lectures, student-led paper presentations, assignments, and a research project, students develop the skills needed to design, implement, and evaluate agentic AI systems. (3 credits) fall, spring, summer

AAIN7420 DATA ENGINEERING FOR AI

This course focuses on the data engineering and operational practices required to build dependable AI systems. Students build machine-learning-ready pipelines (batch and streaming), implement data quality and governance controls, design feature pipelines to ensure training/serving consistency, orchestrate workflows, and monitor data/model signals for drift and incidents. (3 credits) fall, spring, summer

AAIN7422 EXPLAINABLE ARTIFICIAL INTELLIGENCE

This course introduces the principles and methods for designing interpretable, transparent, and trustworthy AI systems. Students study both model-agnostic and model-specific explainability techniques for machine learning and deep learning, including feature attribution, saliency mapping, local surrogate models, counterfactual reasoning, and post-hoc interpretation. Emphasis is placed on the trade-offs between accuracy, transparency, fairness, and accountability in real-world domains such as healthcare, finance, and autonomous systems. Through hands-on projects and critical analysis, students learn to design and evaluate explainable AI models that support responsible decision-making. (3 credits) fall, spring, summer

AAIN7424 INTELLIGENT SYSTEMS

This course provides a comprehensive introduction to the theory and practice of intelligent systems—computational systems that perceive, reason, learn, and act autonomously. Students explore a range of topics, such as perception, reasoning, learning modules, and agent-based architectures. Emphasis is placed on how these components integrate into real-world intelligent systems such as autonomous agents, decision-support systems, and adaptive environments. Students design and evaluate intelligent systems capable of perceiving their environment and responding autonomously. (3 credits) fall, spring, summer

AAIN7430 PROMPT ENGINEERING

This course provides an in-depth exploration of prompt engineering, a critical skill for leveraging the capabilities of large language models (LLMs) in advanced AI and natural language processing applications. Students learn how to implement, and optimize prompts to interact with AI systems effectively, using state-of-the-art tools and techniques. The course emphasizes practical, hands-on experience, enabling students to build and fine-tune prompt-based solutions in various domains such as automated content generation, conversational agents, and data analysis. Ethical considerations, such as bias mitigation and responsible AI design, are integrated throughout the curriculum. By the end of the course, students possess the expertise to develop sophisticated AI applications through the power of prompt engineering. **Prerequisite:** COMP7700 (3 credits) *fall, spring, summer*