

ARTIFICIAL INTELLIGENCE (AI)

AI 240 Introduction to Artificial Intelligence

2 Class Hours, 2 Lab Hours, 3 Quarter Credit Hours

Prerequisites: SE 126

This course introduces students to the field of Artificial Intelligence (AI). They will learn the fundamentals of machine learning, computer vision, Natural Language Processing (NLP), and generative AI. Successful completion of this course prepares students to take the AI-900 Microsoft AI Fundamentals certification exam.

AI 250 Artificial Intelligence Applications

3 Class Hours, 3 Quarter Credit Hours

Students will explore practical, real-world applications spanning across diverse domains including business, public health, climate change, disaster management, and non-profit sectors.

AI 370 Introduction to Machine Learning

3 Class Hours, 2 Lab Hours, 4 Quarter Credit Hours

Prerequisites: AI 240

In this course, students will learn how to build and train supervised machine learning models using Python libraries such as NumPy and scikit-learn, focusing on tasks like prediction and binary classification.

AI 380 Machine Learning Operations

3 Class Hours, 2 Lab Hours, 4 Quarter Credit Hours

Prerequisites: AI 370

Students will learn to design, implement, deploy, maintain, fine tune, and monitor AI solutions on the Azure platform. Successful completion of this course prepares students for the Azure AI Engineer Associate certification exam.

AI 390 Neural Networks

3 Class Hours, 2 Lab Hours, 4 Quarter Credit Hours

Prerequisites: AI 370

Students will learn to create and train neural networks using TensorFlow for multi-class classification tasks. Students will apply best practices in machine learning development to ensure models can effectively deal with real-world data and tasks. Topics include decision trees, as well as advanced tree ensemble methods, random forests and boosted trees. Students will also study reinforcement learning as another advanced application of neural networks.

AI 392 Generative AI with Large Language Models

3 Class Hours, 2 Lab Hours, 4 Quarter Credit Hours

Prerequisites: AI 370

Students will study the architecture of Large Language Models (LLMs), learn how to train and fine tune them and understand their role in creating generative AI. Students will also explore the challenges and opportunities that go along with this emerging technology.

AI 400 Advanced Machine Learning

2 Class Hours, 2 Lab Hours, 3 Quarter Credit Hours

Prerequisites: AI 380

Students will use AWS Cloud tools to design, build, deploy, optimize, train, tune, and manage Machine Learning (ML) solutions. Students will gain a basic understanding of the intuition behind ML algorithms, learn best practices in ML and perform basic optimizations. AWS services and tools covered include Amazon Kinesis products, AWS Batch, Amazon EC2, AWS Glue, and AWS IoT Greengrass.

AI 402 Computer Vision

2 Class Hours, 2 Lab Hours, 3 Quarter Credit Hours

Prerequisites: AI 380

Using TensorFlow, students will learn to process, analyze, and extract meaningful information from images and videos, enabling applications like object detection, image classification, and facial recognition.

AI 404 Natural Language Processing

3 Class Hours, 2 Lab Hours, 4 Quarter Credit Hours

Prerequisites: AI 380

Students will develop the skills to create Natural Language Processing (NLP) applications capable of executing tasks such as question-answering and sentiment analysis and will learn to develop tools for language translation, text summarization, and chatbots.

AI 420 AI Ethics and Law

3 Class Hours, 3 Quarter Credit Hours

This course explores the intersection of AI, ethics, and the law, delving into topics like algorithmic bias, privacy concerns, and accountability in automated decision-making. Through case studies and discussions, students will gain practical insights into navigating the ethical and legal challenges of AI deployment.

AI 422 Hadoop

3 Class Hours, 2 Lab Hours, 4 Quarter Credit Hours

Prerequisites: SE 419

Building on the concepts introduced in SE 419, students are introduced to the Hadoop and Spark frameworks. Students will explore Hadoop architecture, software stack, and execution environment and gain hands-on experience on these platforms applying techniques such as Map-Reduce.