

JAMESTOWN COMMUNITY COLLEGE
State University of New York

INSTITUTIONAL COURSE SYLLABUS

Course Title: Introduction to AI Development

Course Abbreviation and Number: CSC 2560

Credit Hours: 4

Course Type: Lecture

Course Description: This course provides a practical introduction to artificial intelligence, focusing on the development of AI-powered bots and agents. Students will explore machine learning, deep learning, and large language models using Python. Students will gain hands-on experience in building AI projects and managing performance, including detecting and mitigating model drift. The course emphasized ethical considerations and privacy concerns in AI development, preparing students for roles in AI and related fields.

Prerequisite/Corequisite: CSC 1590.

General Education Requirements Met

Student Learning Outcomes:

Students who demonstrate understanding can:

1. Apply machine learning algorithms to real-world problems.
 2. Develop deep learning models.
 3. Construct a simple chatbot using a large language model.
 4. Evaluate the ethical and privacy considerations in AI projects.
 5. Integrate AI into a small project.
-

Topics Covered:

1. **Introduction to AI (15%)**
 - Overview of artificial intelligence and its history
 - Types of AI: Narrow, General, Superintelligence
 - AI applications in various industries (healthcare, finance, education)
 - Ethical considerations in AI development
2. **Machine Learning Fundamentals (20%)**
 - Supervised and unsupervised learning concepts
 - Regression, classification, clustering, and dimensionality reduction techniques
 - Data preprocessing and feature engineering
 - Introduction to Python libraries like scikit-learn and TensorFlow
3. **Deep Learning Essentials (20%)**
 - Introduction to neural networks and deep learning frameworks
 - Convolutional neural networks (CNNs) for image classification
 - Recurrent neural networks (RNNs) for text analysis
 - Transfer learning and model fine-tuning
4. **Large Language Models and Chatbots (15%)**
 - Overview of large language models (LLMs): architectures and applications
 - Building simple chatbots using LLMs (text generation, dialogue systems)
 - Introduction to prompts and prompt engineering for LLMs
 - Case studies: chatbots in customer service and language translation
5. **Project Development (20%)**
 - Design and implement a small AI-powered bot or agent (e.g., chatbot, game agent)
 - Use Python to integrate AI models into a project
6. **AI Model Monitoring and Drift Management (10%)**
 - Understanding model drift: data drift vs. concept drift
 - Monitoring model performance metrics over time (accuracy, precision, F1-score)
 - Statistical methods for detecting drift (e.g., Population Stability Index, Kolmogorov-Smirnov test)
 - Strategies for mitigating drift: retraining models, shadow models, online learning

• Drift Detection in Project Development: Integrate drift monitoring into project bots/agents, ensuring they can adapt to changing conditions and maintain performance.

• **Peer Review and Presentation:** Present final projects and receive feedback from peers, focusing on model performance, user experience, and ethical considerations.

Information for Students

- Expectations of Students
 - [Civility Statement](#)
 - [Student Responsibility Statement](#)
 - [Academic Integrity Statement](#)
- [Accessibility Services](#)
Students who require accommodations to complete the requirements and expectations of this course because of a disability must make their accommodation requests to the Accessibility Services Coordinator.
- [Get Help: JCC & Community Resources](#)
- [Emergency Closing Procedures](#)
- Course grade is determined by the instructor based on a combination of factors, including but not limited to, homework, quizzes, exams, projects, and participation. Final course grade can be translated into a grade point value according to the following:

A=4.0	B+=3.5	B=3	C+=2.5	C=2	D+=1.5	D=1	F=0
-------	--------	-----	--------	-----	--------	-----	-----

- Veterans and active duty military personnel with special circumstances (e.g., upcoming deployments, drill requirements, VA appointments) are welcome and encouraged to communicate these to the instructor.

Effective Date: Fall 2026