CSC 113 Artificial Intelligence Fundamentals

COURSE DESCRIPTION:

Prerequisites: None
Corequisites: None

This course provides a survey of artificial intelligence and machine learning. Topics include the history, development, and current applications of artificial intelligence and machine learning. Upon completion, students should be able to demonstrate general artificial intelligence and machine learning concepts. Course Hours per Week: Class, 2. Lab, 2. Semester Hours Credit, 3.

LEARNING OUTCOMES:

Upon completing requirements for this course, the student will be able to:

1. Explain key artificial intelligence and machine learning concepts.
2. Identify common applications of artificial intelligence and machine learning across business, industry, education, and society.
3. Compare basic artificial intelligence and machine learning approaches used to solve problems and support decision-making.

OUTLINE OF INSTRUCTION:

I. Progression of AI
   - A. Changing Business in the Blink of an AI
     - i. AI applications, business automation, and conversational AI
     - ii. Basic prompt engineering, AI accuracy, privacy, and bias
   - B. Progressing from Turing to Deep Learning
     - i. AI history, the Turing Test, machine learning, and deep learning
     - ii. AI productivity tools and economic implications
   - C. Natural Language Processing
     - i. Language understanding, speech recognition, and multimodal AI
     - ii. NLP prompting and applications in recruitment and business
   - D. Machine Learning and Generative AI
     - i. Big data, machine learning, and language models
     - ii. Conversational AI, model capabilities, limitations, and applications
   - E. Computer Vision
     - i. Image recognition and interpretation of visual information
     - ii. Computer vision applications and assistive technologies
   - F. Inequities and Inclusion
     - i. Bias, misinformation, deepfakes, and equitable AI use
     - ii. AI accessibility, inclusion, and educational applications

II. Robotics, Cybersecurity, and Chatbot
   A. Robotics: Bringing AI to the Physical World
      i. Robotics systems, sensors, autonomy, and physical-world applications
      ii. AI robots in manufacturing and other industries
   B. Applying AI to Cybersecurity
      i. AI-assisted threat detection and cybersecurity applications
      ii. Security risks, defenses, and emerging challenges
   C. Building a Chatbot: The Future of Conversation
      i. Chatbot purposes, components, and knowledge bases
      ii. Chatbot design, creation, customer service, and risks

III. Ethics and Societal Impacts
   A. Ensuring Ethical Development
      i. AI governance, legal oversight, and responsible guidelines
      ii. Fairness, privacy, data rights, sustainability, and AI-generated media
   B. Reshaping Society and Transforming the Labor Market
      i. AI in marketing, healthcare, supply chains, and entrepreneurship
      ii. Workforce changes, career pathways, and future preparation
   C. AI in Education
      i. Educational accessibility, inclusion, and personalization
      ii. Opportunities, limitations, and responsible use in learning

REQUIRED TEXTBOOK AND MATERIAL:

The textbook and other instructional material will be determined by the instructor.