Title: Introduction/Principles of AI, Spring 2020
Instructor: Oladunni, Timothy
Office Location: Bldg. 42, Room 112 E
Class Location: 42 - Engineering 108
Instructor's Email: Timothy.oladunni@udc.edu
Class Hours: Monday, 6:00 pm - 8:50 pm
Office Hours: Monday and Wednesday 4:00pm – 6:00pm

A. Course Description

The quest for the technological automation of intellectual tasks performed by man points to the inevitability of Artificial Intelligence (AI). This trajectory is evident in self-driving car, search engines, acoustic analysis, image captioning etc. In the future, we expect AI to impact our daily lives just as the internet does today. Artificial Intelligence is an emerging field of computer science that studies the theory and methodologies of making a machine that can sense, reason, think and act as humans. We will explore AI in Natural Language Processing, Cyber Security, Computer Vision, etc. Other topics in this class include; Introduction to AI, Artificial Neural Networks, Heuristic Search, Techniques, Markov Decision Processes, Reinforcement Learning, Bayes Nets and, Probabilistic Reasoning, etc.

B. Course Objective

The primary purpose of this class is to provide students the necessary skills in AI. The class is a combination of the theory and practical experimentation of AI concepts and principles. We will use state of the art tools for the implementation of our class projects. Furthermore, we will familiarize ourselves with the main building blocks of AI and its impact on the society. Our approach will be based on statistics, linear algebra, calculus and computer science.

C. Prerequisites

Students are expected to have completed the Data Structure class or its equivalent before registering for this class.

Laboratory works/assignments will be in Python programming language.

D. Learning outcome

At the end of this course, students are expected to have understood:

- Design, development and evaluation of learning algorithms
- Application of AI to real world problems

E. **Course Schedule (Tentative)**

Week	Topic
1.	Class overview and Introduction to AI
2.	Martin Luther King, Jr., Day Observance (University Closed)
3.	Artificial Neural Networks
4.	AI In Natural Language Processing
5.	AI in Computer Vision and Robotics
6.	President's Day Observed (University Closed)
7.	AI in Cyber-Security
8.	Project Proposal
9.	Spring Break (Classes Suspended)
10.	Heuristic Search Techniques
11.	Constrain Satisfaction Problem
12.	Markov Decision Processes
13.	Reinforcement Learning
14.	Bayes' Nets
15.	Probabilistic Reasoning
16.	Final Project Presentation

F. **Python Proficiency Test**

There is a python proficiency test at the beginning of this course for students who need exception from python programming.

G. **Evaluation**

Final grade will be based on the following:

Assignment 20%

Homework 10%

Project Proposal 10 %

Test 20%

Final Project 40%

H. References

1. Artificial Intelligence - A Modern Approach, Second Edition by Stuart J. Russell and Peter Norvig
2. Deep Learning by Goodfellow, Bengio, Courville

http://www.deeplearningbook.org/

3. Programming in Python 3 with zyLabs

I. Resources

1. Pattern Recognition and Machine Learning (Information Science and Statistics) by Christopher M. Bishop
2. Pattern Classification Richard O. Duda, Peter E. Hart, David G. Stork