

THE UNIVERSITY OF TEXAS AT TYLER
DEPARTMENT OF COMPUTER SCIENCE
COSC4381 Seminar in Computer Science/ COSC5390 Topics in Computer Science:
Artificial Intelligence Using Python
Spring 2022

Instructor: Nary Subramanian, Ph.D.
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Lecture: TR 8.00 am to 9.20 am COB 211

Office Hours: TR 10.50 am to 12:20 pm

Text: *Python Machine Learning: Machine Learning and Deep Learning with Python, scikit-learn, and TensorFlow 2* by Sebastian Raschka and Vahid Mirjalili, 3rd Edition (ISBN: 978-1-78995-575-0)

Catalog Description: This course is designed to study current trends in computer science or computer information systems.

Course Description: Artificial Intelligence (AI) has emerged as one of the most important areas of Computer Science both from the viewpoint of the practitioner as well as the researcher. Automated image recognition, digital voice recognition, self-driving vehicles, medical diagnostics, and advanced robotics are fields that are heavily dependent on latest developments in AI. As of January 2022, there were about 18000 job openings for AI in the USA alone and the job growth in AI is, in my opinion, in excess of 50% each year. So knowledge of AI will help students in the fields of Computer Science, Computer Information Systems, and Information Technology, find high paying jobs almost immediately after college. A closely related aspect to AI is Machine Learning (ML): while AI predicts new knowledge, ML learns from the past data and helps with the predictions. One of the most widely used programming languages for AI is Python - in fact, for the month of January 2022, Python is ranked as the most popular programming language in the TIOBE index. In this course we will learn fundamentals of AI and ML by using Python for coding. All programming will be done using the Jupyter browser interface.

Grading: Grading will be based on exams and projects. All project submissions should be made electronically to Canvas – no physical paper submissions will be accepted. Late submissions will not be graded. There will be two mid-term exams as per schedule given later. Weights are given below:

First Midterm Exam	25%
Second Midterm Exam	25%
Final Exam	25%
Projects	25%

Grading Policy:

Points	Grade
≥85	A
≥75, < 85	B
≥65, < 75	C

Course Objectives:

1. Understand the difference between AI and ML
2. Know the underlying theory of AI algorithms
3. Select appropriate AI technique for a given problem
4. Develop an AI solution for a given problem

5. Implement the AI solution in the Python programming language

Tentative Schedule:

<u>Week</u>	<u>Chapter</u>	<u>Topic</u>
1	1	Introduction to AI and ML
2		Python Basics
3		Python Basics
4	2	Using ML for Classification
5	3	Classification Using scikit-learn
6	FIRST MIDTERM EXAM, Tuesday, February 15th, 2022	
6	4	Data Preprocessing
7	5	Dimensionality Reduction
8	8	Sentiment Analysis
9	9	Embedding ML in a Web Application
10	10	Regression Analysis
11	11	Clustering
12	SECOND MIDTERM EXAM, Tuesday, April 5 th , 2022	
12	12	Multilayer Neural Network
13	13	TensorFlow
14	15	Classifying Images using CNN
15	FINAL EXAM, Tuesday, April 26 th , 2022 from 8am to 10am	

Census Date: January 24th, 2022

Attendance and Make-up Policy

It is in your interest to attend all classes. There will be no make-ups for missed exams. Missed exams will get a grade of zero.

University Policies

University policies can be seen at <https://www.utt Tyler.edu/academic-affairs/files/syllabuspolicy.pdf>. They are given below as well.