Artificial Intelligence
CSCI 4304, ESMA 3303, SICT 4304
Course Syllabus

General Information

Semester: 2nd Semester 2022-2023 (20232).
Department: Department of Computer Science.
Instructor: Dr. Iyad Husni Alshami,
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Prerequisite: Discrete Mathematics, Programming (Python).

Course description

Artificial Intelligence (AI) studies how computers can accomplish tasks that were traditionally thought to require human intelligence. The aim of this course is to give an overview of some basic AI algorithms and an understanding of the possibilities and limitations of AI. The course begins by describing what the latest generation of artificial intelligence techniques can actually do. After an introduction of some basic concepts and techniques, the course illustrates both the potential and current limitations of these techniques with examples from a variety of applications. We spend some time on understanding the strengths and weaknesses of human decision-making and learning, specifically in combination with AI systems .

Course Objectives

This course is designed to provide student with the main fundamentals of Artificial Intelligence (AI). The course covers the main techniques that are used in AI examples (from chess-playing to self-driving cars). These techniques include Search Algorithms, Probability, Reasoning and Inference, programming logic, Expert systems, Rule-based systems, Fuzzy logic, Machine Learning, Knowledge Representation, Pattern recognition, and natural language processing. The course helps students to use AI to solve specific problems in their future careers. The theoretical part of the course focuses on understanding concepts, structures, and algorithms, while the practical part (lab) includes a set of exercises to be performed using AI tools such as CLIPS, Weka, and Python.

Text book

- **Text Book:** "*Artificial Intelligence: A Modern Approach*" 4th Edition by Norvig P. Russell S., ©Prentice Hall (2020).

- **Additional Books:**

  - "*Intelligent Systems for Engineers and Scientists - A Practical Guide to Artificial Intelligence*", 4th Edition by Adrian A. Hopgood (2021)

- "*Artificial Intelligence: Intelligent Systems Approach.*", 3rd Edition by Michael Negnevitsky, © Pearson Education Limited (2011).

- "*Artificial Intelligence and Expert Systems*", by Itisha Gupta & Garima Nagpal (2020)

- "*Foundations of Machine Learning.*", 2nd Edition by Mehryar Mohri, Afshin Rostamizadeh, Ameet Talwalkar, ©MIT Press (2018)

Teaching Methods

- Lectures,
- Assignments,
- Discussion,
- Quizzes & Examination.

Evaluation Criteria "Grades"

- 20% Course Activities
  - 10% Quizzes,
  - 10% Assignments
- 30% Midterm Exam
- 50% Final Exam.

Course Outline "Tentative"

Week	Topic
1	Introduction to AI
2	Intelligent Agents
3	Solving Problems by Searching Strategies
4	Heuristic Functions
5 6	Game Playing
7 8	Genetic Algorithms
9 10	Markov Decision Process MD
11	Introduction to Machine Learning
12 13	Artificial Neural Networks (Supervised)
14	Artificial neural networks (Unsupervised)
15	Project Presentation
16	Final Exam

Notes

- The course contents and grading can be changed as necessary.
- **Missing more than 25% of lectures** will provide you "**W**" in course.
- There **is no predetermined schedule** for the course activities.
  - **No excuses** for missing the quizzes.
  - **No excuses** for exceeding the assignments deadline.
  - **No grads** for copied assignments.