**National University of Computer & Emerging Science**

**Department of Computer Science, Lahore**

**Spring 2017**

## CS401: Artificial Intelligence

Prerequisite: CS201: Data Structures

Section: D, E, F

Course Instructor: Noshaba Nasir

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Office Hours: Wednesday 12pm to 2pm (email for any other time)

## Recommended books

Artificial Intelligence (A Modern Approach) By Russell and Norvig

Machine Learning By Tom Mitchel

Heuristics: Intelligent Search Strategies for Computer Problem Solving By Judea Pearl

## Course Objectives

The objective of this course is to introduce students to the field of Artificial intelligences and to equip them to use to AI to handle practical problems. Students will be learning Search techniques, game playing, machine learning and probabilistic models and apply them in various field of NLP image processing and speech processing.

## Tentative Grading Scheme

## Midterms (30%), Quizzes/CP/Assignments/Project (25%), Final (45%).

**Grading**

* Minimum eligibility to pass this course is to get 50% marks.
* Academic integrity is expected of all the students. Plagiarism or cheating in any assessment will result in at least an **F** grade in the course, and possibly more severe penalties.
* You will get Reading assignments and coding assignments as well. For coding assignments you are not supposed to share you assignment code with each other, doing so will result in negative marking.

**Tentative Course Outline and Lecture Plan**

Part I

Introduction (1 Lecture)

Intelligent Agents (1 Lecture)

Problem Solving via Searching (4 Lectures)

Uninformed Search Strategies, Informed Search

Local Search Strategies (1 Lecture)

Hill climbing, Simulated annealing, local beam search, Random search

Game Playing (3 Lectures)

Complete Information Zero-Sum Games, Games with uncertainty, and Games with only partial information

Part II

Learning from Examples (Machine Learning)

Introduction Classification vs Regression (1 Lecture)

Classification (4 Lectures)

Supervised vs Unsupervised Learning Commonly used supervised learning methods Decision Tree Learning, Neural Networks, KNN Computing performance of a learned classifier

Probability (5 Lectures)

Review of Probability, Belief Networks and Probabilistic Inference Naive Bayes’ and Text Processing Advanced Topics like HMM, Assignment discussion,

Part III

Project Discussion

Computer Vision Fundamentals (2 Lectures)

Applications of AI in Computer Vision (2 lectures)

Text Processing (2 Lecture) Speech Processing (2 Lectures)

Using some existing speech processing APIs (2 Lectures)