

# CS4320/5314 – Artificial Intelligence

## Instructor: Olac Fuentes

### Spring 2009

**Instructor:**

Olac Fuentes

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Office hours: Tuesdays and Thursdays 11:00-12:00 or by appointment, in CSB 208 (feel free to drop by at other times if I'm there).

**Teaching Assistant:**

Melisa Vela

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Office hours: Mondays 12:30-1:30, Tuesdays 11:00-12:00, Wednesday 4:30-5:30, Thursdays 11:00-12:00, Fridays 12:30-2:30, in CSB 304.

**Meeting Times:**

MW 3:00-4:20, CSB 321

**Course Contents:**

Part I - Fundamentals

- 1) Introduction
  - a) History
  - b) The Turing test
- 2) Search
  - a) Breadth first
  - b) Depth first
  - c) Heuristic search
  - d) Evolutionary algorithms
  - e) Adversarial search
- 3) Knowledge representation and reasoning
  - a) Propositional calculus
  - b) Predicate calculus
  - c) Fuzzy logic
  - d) Bayes nets
- 4) Machine Learning
  - a) Decision trees
  - b) Neural networks
  - c) Ensembles

Part II - Applications

- 5) AI in games
- 6) Robotics
  - a) Probabilistic robotics
  - b) Mapping and navigation
- 7) Computer Vision

- a) Object recognition
- b) Tracking
- 8) Natural Language Understanding
  - a) Text classification

**Pre-requisites:**

There are no formal prerequisites, but knowledge of programming, elementary calculus, linear algebra, probability, and statistics is useful.

**Grading:**

**CS4320**

2 Midterm exams 20% each  
Homework and Programs 15%  
Final exam 25%  
Course Project 20% (2 presentations)

**CS5114**

2 Midterm exams 20% each  
Homework and Programs 15%  
Final exam 20%  
Course Project 25% (2 presentations)

**Course Project:**

Students will work on teams of size two to four on research projects involving an artificial intelligence technique applied to a relevant problem. Each team will present a project proposal approximately half way through the semester describing the problem to be solved and the techniques to be applied. At the end of the semester students will present final results and submit a project report. No team may have more than one graduate student.

**Bibliography:**

**Text:**

- Artificial Intelligence: A Modern Approach, Stuart Russell and Peter Norvig, Prentice Hall, 2003.

**Others:**

- Machine Learning, Tom Mitchell, Prentice Hall, 1998

**Tools:**

- WEKA
- Matlab