

CPSC 420-200 Artificial Intelligence (Honors): Spring 2005

Syllabus

NEWS: 1/17/05, 03:41PM (Mon)

- [1/17] [slide01.pdf](#) uploaded for the first class: print and bring to class.
- [1/17] [syllabus.pdf](#) uploaded: print and bring to class.

Read-Only Bulletin Board: 1/17/05, 01:15PM (Mon)

Page last modified: 1/19/05, 01:15AM Wednesday.

[General Information](#)

[Resources](#)

[Weekly Schedule](#)

[Credits](#)

[Lecture Notes](#)

I. General Information

Instructor:

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Prerequisite/Restrictions:

CPSC 311, GPA (Min GPR 3.4 required for catalog 126 or lower; min GPR 3.5 required for catalog 127 or greater)

Lectures:

MWF 10:20am-11:10am HRBB 126.

Goals:

To understand the problems in AI and to learn how to solve them:

1. traditional AI techniques (search, pattern matching, logical inference, theorem proving, etc.).
2. modern approaches in AI (learning, probabilistic approaches, etc.).

Textbook:

Stuart Russell and Peter Norvig, *Artificial Intelligence: A Modern Approach* (AIMA, hereafter), **2nd Edition**, Prentice Hall, New Jersey, 2003.
ISBN 0-13-790395-2
[Book Homepage](#)

Computer Accounts and Usage:

1. Computer accounts: if you do not have a unix account, ask for one on the CS web page. We will be using the [CMU Common Lisp](#) as our main language. You can choose your own language to use for the assignments, but you have to first get permission from the instructor.
2. CMU Common Lisp:
 - [Carnegie Mellon U. Common Lisp homepage](#)
 - On all SunOS systems in the department (**unix, interactive, compute**, etc.), the program is installed in `/usr/local/bin/lisp`.
 - See the [Read-only Board](#) for a brief example.

Topics to be covered:

See the [Weekly Schedule](#) section for more details.

1. Introduction : 1 week
2. LISP : 1 week
3. Search : 1.5 weeks
4. Game Playing : 0.75 week
5. Propositional Logic, First-order logic: 3.5 weeks
6. Uncertainty : 1 weeks
7. Learning : 2.5 weeks
8. Special Topics : 1 week

Grading:

1. Exams: 45% (midterm: 20%, final: 25%)
2. Homeworks (about 3): 15%
3. Programming Assignments (about 3): 36%
4. Paper commentary (about 1): 4%

Grading will be on the absolute scale. The cutoff for an 'A' will be at most 90% of total score, 80% for a 'B', 70% for a 'C', and 60% for a 'D'. However, these cutoffs might be lowered at the end of the semester to accommodate the actual distribution of grades.

Academic Policy:

The TAMU student rules (<http://student-rules.tamu.edu/>), [Part I Rule 20](#) will be **strictly** enforced.

Local course policy is as follows:

- All work should be done **individually** and **on your own** unless otherwise allowed by the instructor.
- Discussion is only allowed immediately before, during, or immediately after the class, or during the instructor's office hours.
- If you find solutions to homeworks or programming assignments on the web (or in a book, etc.), you may (or may not) use it. Please talk to the instructor first for permission.

Students with Disabilities:

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the [Department of Student Life: Services for Students with Disabilities](#) in Room 126 of the Koldus Building, or call 845-1637. (The source of this passage is [TAMU Phil320 Syllabus](#).)

II. Resources

1. [LISP quick reference](#)
2. [CMU Common Lisp](#) (This one will be used in the class.)
3. [GCL manual](#) (very in-depth and technical).
4. [GNU Common Lisp](#)
5. [Lisp resources](#)
6. [My general resources page](#)
7. [420 Reading List](#)

III. Weekly Schedule and Class Notes

- [Lecture notes \(in PDF format\)](#): all notes will be uploaded in this directory.
- It is **your responsibility** to download, print, and bring the notes to the class. Notes will be available 24 hours before each class.
- See the [2005 Spring TAMU Calendar](#) for breaks, etc. December 9 (Tue) is the last class day.
- When reading the chapters, you do not have to memorize everything. A separate list of terms you need to know will be handed out prior to each exam.
- All reading material below refers to the AIMA book 2nd edition. The (*old XX*) tags next in the Reading field are the corresponding chapters in the old AIMA book (1st edition). To see how the 1st and the 2nd edition chapters correspond, see the "[AIMA 1st and 2nd edition chapter map](#)".
- This is a very rough draft: More detail will be available as we go along.

| Week | Date | Topic | Reading | Assignments | Notices and Dues | Notes |
|------|------|--|---|---|---------------------------|-----------------------------|
| 1 | 1/17 | MLK Day (Holiday) | | | | |
| 1 | 1/19 | Introduction | Chapter 1 1.1 and 1.2 | | | slide01.pdf |
| 1 | 1/21 | Introduction | Chapter 26 26.1 and 26.2 | | | |
| 2 | 1/24 | Lisp | Lisp quick ref | Program #1 assigned; skeleton code (deriv.lsp) | | |
| 2 | 1/26 | Uninformed Search (BFS,DFS,DLS,IDS) | Chapter 3.1-3.5 (3.6,3.7 optional) | | | |
| 2 | 1/28 | Informed Search (BFS, Greedy, A*) | Chapter 4.1-4.3 (4.4 optional) (old 4.1-4.3) | | | |
| 3 | 1/31 | " | | | | |
| 3 | 2/2 | IDA*, Heuristic Search, Simulated Annealing, etc. | Chapter 4 | | | |
| 3 | 2/4 | " | | | | |
| 4 | 2/7 | Game playing Min-Max, Alpha-Beta | Chapter 5 (optional) and 6.1-6.8 (old 5) | Program #2 assigned | Program #1 due (in class) | |
| 4 | 2/9 | " | | | | |
| 4 | 2/11 | Game playing wrap up Propositional Logic | Chapter 7.1, 7.3, 7.5, 7.6 (old 6) | | | |
| 5 | 2/14 | Theorem proving | Chapter 9 (old 10) | Homework #1 announced | | |
| 5 | 2/16 | " | | | | |
| 5 | 2/18 | " | | | | |
| 6 | 2/21 | First-order logic | Chapter 8 (old 7) | Homework #2 announced | Homework #1 due | |
| 6 | 2/23 | " | | | | |

| | | | | | |
|----|-------------|--------------------------------------|---|---|----------------|
| 6 | 2/25 | " | | | |
| 7 | 2/28 | Inference for FOL | Chapter 9 | | |
| 7 | 3/2 | Theorem proving for FOL | Chapter 9 (old 10) | Homework #2 due; | |
| 7 | 3/4 | Midterm | Exam | | |
| 8 | 3/7 | " | | Mid-semester grades due | |
| 8 | 3/9 | Uncertainty | Chapter 13 (old 14) | Program #2 due | |
| 8 | 3/11 | " | | | |
| 9 | 3/14 | Spring Break | | | |
| 9 | 3/16 | Spring Break | | | |
| 9 | 3/18 | Spring Break | | | |
| 10 | 3/21 | Uncertainty; Probabilistic reasoning | Chapter 14 (old 15) | | |
| 10 | 3/23 | Inductive Learning | Chapter 18 | Program #3 announced | |
| 10 | 3/25 | Reading Day: No class | | | |
| 11 | 3/28 | Inductive Learning | | | |
| 11 | 3/30 | Learning (supervised) | Chapter 20 (old 19) | | |
| 11 | 4/1 | No Class | Make-up TBA | To attend WAM-BAMM'05 | |
| 12 | 4/4 | Learning (supervised) | Chapter 20 (old 19) | April 5 (Q-Drop) | |
| 12 | 4/6 | " | | | |
| 12 | 4/8 | Unsupervised learning | | | |
| 13 | 4/11 | " | | | |
| 13 | 4/13 | " | | | |
| 13 | 4/15 | Evolutionary learning | | Homework #3 announced | |
| 14 | 4/18 | Semantics in autonomuos agents | Choe & Bhamidipati (2003) | | |
| 14 | 4/20 | Semantics in autonomuos agents | Choe & Bhamidipati (2003) | | |
| 14 | 4/22 | Analogy | Choe (2002) | Paper commentary announced | Program #3 Due |
| 15 | 4/25 | Analogy | " | | |
| 15 | 4/27 | Natural language processing | Chapter 22 (old 22) | | |
| 15 | 4/29 | " | | Homework 3 due | |
| 16 | 5/2 | Distributed Representation | Binary Spatter Code | | |
| 16 | 5/3 | Final Review | | | |
| | 5/10 | Final | Exam | 8:00-10:00am Paper commentary due | |

IV. Credits

Many ideas and example codes were borrowed from [Gordon Novak's AI Course](#) and [Risto Miikkulainen's AI Course](#) at the University of Texas at Austin (Course number CS381K).

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