University of Denver
COMP 3703/4703
Artificial Intelligence for Traditional Games
Winter 2013

Professor:	**Dr. Nathan Sturtevant** **John Greene Hall 119** **sturtevant@cs.du.edu** **OH: TuTh 4:00-5:00; Fr 10:30-12:00**
TA	**Will Mitchell** **John Greene Hall 329** **OH: MW 2:00-4:00 and TR 4:00-5:00**

Course Web Page:	**http://www.cs.du.edu/~sturtevant/w13-games.html**
Lecture Room & Time:	**John Greene Hall 316** **TuTh 10:00-11:50am**

Course Description:	This course covers traditional work in the area of AI for games. Students in the course will learn about the history of AI and games, and the techniques used to create human-level AI for traditional games. Topics include approaches for games of perfect and imperfect information and games with two or more players.
Course Prerequisites:	Systems programming and reasonably good programming ability.

Required Textbook:

There is no textbook to purchase for this course. Suggested readings will be posted on the course web page and/or handed out in class.

Grade Evaluation:

COURSEWORK	WEIGHTING
Assignments	**60%**
Final Project	**20%**
Midterm (March 7)	**20%**
Class Participation	**5% bonus/penalty**

In additional to the regular work load, students enrolled in 4703 will be required to make a 30-minute presentation on a research paper at some point during the term.

3703 students may work on the homework/project in small groups subject to instructor approval; 4703 students must complete the work independently.

Course marks will be determined on a fixed scale, but individual assignments will be weighted on a curve.

LATE WORK: Late work will be accepted at a penalty of 10% per day. That is, an assignment turned in 1 min-24 hours late will receive a maximum of 90% credit. An assignment 24-48 hours late will receive a maximum of 80% credit.

EXAMS: Electronic equipment (such as a calculator, MP3 player, or cell phone) is not to be brought to the exam.

CELL PHONES: Cell phones are to be turned off/silent during lectures.

LAPTOP COMPUTERS: Laptops can be brought to lecture for the purpose of taking notes. They should not be used for other purposes during lecture. If the use of a laptop during lecture becomes disruptive, you may be requested to discontinue its usage.

Tentative Course Schedule

Week	Dates	Topic
1	January 8	Course overview, History of games
	January 10	Course project intro, State spaces
2	January 15	Nash equilibria, search trees, minimax
	January 17	Alpha-beta pruning, expecti-minimax
3	January 22	Iterative deepening, move ordering
	January 24	Transposition tables, GHI
4	January 29	TD Learning, linear regression
	January 31	Othello case study, TD-gammon case study
5	February 5	Imperfect information: Monte-Carlo sampling
	February 7	Bridge / Skat / Hearts
6	February 12	Multi-player games, max^n
	February 14	Pruning for max^n
7	February 19	Bandit/regret algorithms UCB / UCT
	February 21	Monte-Carlo Tree Search / Go
	February 22	Guest Speaker: Michael Buro
8	February 26	Abstracting imperfect information: CFR
	February 28	Poker case study
9	March 5	General Game Playing
	March 7	Midterm
10	March 12	Final Competition