CSCI–4150 Introduction to Artificial Intelligence
Fall 2001

	Instructor	TA
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office hours:	Tuesdays 1–3 (or by appointment)	Wednesdays 12:30–3:30 (or by appointment)

classroom:	Sage 3303 (for now)
times:	Monday and Thursday 10:00am - 11:50am
prerequisite:	CSCI–2300 Data Structures and Algorithms
text:	Nilsson, "Artificial Intelligence: A new synthesis"
www:	http://www.cs.rpi.edu/courses/fall01/ai

Course description

This course is an introduction to the theory and practice of Artificial Intelligence. We will be studying techniques for solving problems and making intelligent decisions. The first half of the course will focus on the foundations of Artificial Intelligence: search and logic. The second half of the course will focus on machine learning techniques, including decision trees, reinforcement learning, and neural networks. Knowledge representation and uncertainty will be addressed in conjunction with several topics during the semester.

Students will implement many of the algorithms we cover in programming assignments. The implementation language for these assignments will be Scheme (a dialect of LISP) which will be taught in the first two weeks of the course.

Course activities & grading

There will be seven assignments, most (if not all) of which will include a programming component. Assignments are to be done individually, with the possible exception of one or two assignments in the second half that will be done in teams or pairs. The worth of each assignment will vary with its length and difficulty, though you can expect a two week assignment to be worth about twice as much as a one week assignment. All assignments count towards the assignment component of your final grade. Assignments will be due on Thursdays.

There will be weekly quizzes every Monday. The intention is to make these short (about 15 minutes) and that they will reinforce your understanding of the course material over the semester. There are 13 Mondays in the fall semester. I will drop the lowest three quiz scores from the quiz component of your final grade. No make-up quizzes will be given!

There will be a final examination to be scheduled during the examination period (December 12–14 and 17–18).

Your final grade will be determined according to the following (tentative) breakdown:

50%	Assignments
25%	Quizzes
25%	Final examination

To ensure that students completing this course have breadth and experience commesurate with the scope of the course, students are required to receive a passing grade on at least four of Assignments 2–7 in order to receive a passing grade for the course.

Course policies

The following policies will be clarified or revised as necessary during the semester. The course home page will be updated with the current versions.

Academic honesty

I encourage you to discuss readings and assignments and to prepare for examinations with others. However, I expect that any assignment or examination that you turn in to be your own work — the product of your understanding of the course material and your own efforts in completing the assignment or examination.

More specifically, it is inappropriate for a student in this class to share code with anyone else.

The Rensselaer Handbook of Student Rights and Responsibilities defines several types of academic dishonesty, all of which are applicable to this class. Students found in violation of academic dishonesty policies may receive a failing grade for this course.

Please contact the instructor if there is any question about academic (dis)honesty.

Late work

Late work places an additional burden on the teaching staff and is unfair to those students who turn in their work on time.

Unless you make *prior* arrangements with the instructor, assignments are due at the beginning of class (10:00am) on the day they are due. All assignments are scheduled to be turned in on Thursdays. A late assignment turned in by midnight Friday night will be assessed a 7.5% penalty. After midnight Friday night, late assignments will be assessed a 15% penalty and will only be accepted for one week after the assignment is due. For assignments which have a written part and a programming part, the late policy will apply separately to each part.

It's difficult to write policies that encourage desired behaviors. In this particular case, I want to encourage students to come to class on Thursday mornings (instead of skipping class after staying up late to finish the assignment.) To that end, I make the following offer on a trial basis: you can receive an automatic extension until midnight on Thursday night by signing up in class. The late penalty deadlines remail the same.

Please note that a two week assignment will generally not be a "one night" assignment and manage your time accordingly.

Attendance

You are responsible for knowing all material covered in class. If you should miss a class, please contact a classmate first to learn what was covered that day. We will attempt to keep the syllabus on the course home page up to date.

Since there are no make-up quizzes, you must be in class to take the quizzes.

Grading appeals

If you disagree with the grading on an assignment or the midterm examination, you should appeal to the TA first. Such appeals must be made within two weeks after the assignment is returned.

Resources

We will be making extensive use of the course home page during the semester. Handouts will be available online through this page as well as other information about the course.

There will be a number of items placed on reserve at the library. The course home page will contain a list of these items.

The instructor and TA will hold regular office hours; you can feel free to drop in during these times. You may also make an appointment to see the instructor or TA(s) outside of these times.

Changes

There will no doubt be changes to policies, deadlines, and so on in this syllabus. You can expect me to give you reasonable notice of any changes. All changes will be announced in class an appear on the course web page.

Tentative Schedule

Week		Date		Topic	Reading	Assignment
1	M	Aug	27	Intro to AI; Intro to Scheme	1	
	R	Aug	30	Intro: Stimulus response agents; Scheme	2	
2	M	Sep	3	NO CLASS — Labor day holiday		
	R	Sep	6	Intro: Neural networks; Scheme	3	#1 due
3	M	Sep	10	Intro: Machine evolution & state machines; Scheme	4 & 5	
	R	Sep	13	Intro: Robot vision; Scheme	6	#2 due
4	M	Sep	17	Search: Blind search	7 & 8	
	R	Sep	20	Search: Heuristic search	9	
5	M	Sep	24	Search: Heuristic search	9	
	R	Sep	27	Search: Iterative improvement searches	11	#3 due
6	M	Oct	1	Search: Iterative improvement searches	11	
	R	Oct	4	Search: Game playing search	12	
7	T	Oct	9	Search: Game playing search	12	
	R	Oct	11	Logic: Introduction, propositional logic	13	#4 due
8	M	Oct	15	Logic: Inference in propositional logic	13 & 14	
	R	Oct	18	Logic: First order logic	15	
9	M	Oct	22	Logic: Inference in first order logic	16	
	R	Oct	25	Logic: Inference in first order logic	16	#5 due
10	M	Oct	29	Logic: Knowledge-based systems	17	
	R	Nov	1	Logic: Planning	22	
11	M	Nov	5	Learning: Introduction, decision trees		
	R	Nov	8	Learning: Probability		#6 due
12	M	Nov	12	Learning: Bayesian learning		
	R	Nov	15	Learning: Numerical optimization & sequential decisions		
13	M	Nov	19	Learning: Reinforcement learning		
	R	Nov	22	NO CLASS — Thansksgiving break		
14	M	Nov	26	Learning: Q learning		
	R	Nov	29	Learning: Artificial neural networks		#7 due
15	M	Dec	3	Learning: Artificial neural networks		
	R	Dec	6	TBA		

The readings refer to chapters of Nilsson's "Artificial Intelligence: A new synthesis." Supplemental readings will be handed out in class as necessary.