CSCI–4150 Introduction to Artificial Intelligence
Fall 2000

	Instructor	TA	Undergrad TA
	Prof. Wes Huang	Arvind Venkatesan	Adam Goode
email:	whuang@cs.rpi.edu	venkaa@rpi.edu	goodea@rpi.edu
office:	Amos Eaton 111, x8189	TBA	
office hours:	Tuesday 4-6 (or by appointment)	TBA	

classroom:	Ricketts 211
times:	Tuesday and Friday 10:00am - 11:50am
prerequisite:	CSCI–2300 Data Structures and Algorithms
texts:	Russell and Norvig, "Artificial Intelligence: A modern approach"
	(optional) Grillmeyer, "Exploring Computer Science with Scheme"
www:	http://www.cs.rpi.edu/courses/fall00/ai
newsgroup:	rpi.courses.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 eight assignments, most 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.

There will be a midterm examination on October 17, which will scheduled outside of our regular meeting time. There will also be a final examination during the final examination period (December 13–15 and 18–19).

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

60%	Assignments
15%	Midterm examination
25%	Final examination

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 that portion of your grade.

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 2–8 in order to receive a passing grade for the course.

Course policies

The following policies will be clarified as necessary during the semester and will be revised if necessary. 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 Fridays. A late assignment turned in by midnight Saturday night will be assessed a 10% penalty. After midnight Saturday night, late assignments will be assessed a 20% penalty and will only be accepted until solutions are distributed, generally a 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 the desired behaviors. In this particular case, I want to encourage students to come to class on Friday 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 5pm on Friday by sending a request via email to the TA. This request must be received before the assignment is due. The 10% penalty deadline remains the same in this case.

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.

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.

In addition, we will also be using the newsgroup `rpi.courses.ai` for questions and clarifications regarding the assignments or programming in Scheme. Announcements will be posted to this newsgroup, and the teaching staff will check periodically to answer any questions that may arise.

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.

Tentative Schedule

Week				Topic	Reading	Assignments
1	T	Aug	29	Intro to AI; Intro to Scheme	1.1–2.3	
	F	Sep	1	Problem solving by search; more Scheme	2.4–3.4	#1 out
2	T	Sep	5	Blind searches; more Scheme	3.5–3.8	
	F	Sep	8	Scheme & blind searches		#1 due, #2 out
3	T	Sep	12	Heuristic searches	4.1–4.2	
	F	Sep	15	Variations on the A* search	4.3	#2 due, #3 out
4	T	Sep	19	Iterative improvement searches	4.4	
	F	Sep	22	Game playing	5.1–5.3	#3 due, #4 out
5	T	Sep	26	Game playing	5.4–5.8	
	F	Sep	29	Knowledge representation, reasoning, & logic	6	
6	T	Oct	3	Inference in FOL	7	
	F	Oct	6	Resolution in FOL	9	#4 due, #5 out
7	T	Oct	10	NO CLASS — follow Monday schedule		
	F	Oct	13	Theorem proving	10.1–10.5	#5 due
8	T	Oct	17	MIDTERM EXAM		
	F	Oct	20	Intro. to learning; Decision trees	18.1–18.3	#6 out
9	T	Oct	24	Decision trees & Information theory	18.4, 18.6	
	F	Oct	27	Probability	14	
10	T	Oct	31	Bayesian learning		
	F	Nov	3	Bayesian belief networks	15.1–15.4	#6 due,#7 out
11	T	Nov	7	Numerical optimization & Sequential decision problems	17	
	F	Nov	10	Reinforcement learning	20.1–20.5	
12	T	Nov	14	Q learning	20.6–20.7	
	F	Nov	17	Artificial neural networks	19.1–19.3	#7 due,#8 out
13	T	Nov	21	Artificial neural networks	19.4–19.5	
	F	Nov	24	NO CLASS — Thanksgiving break		
14	T	Nov	28	Natural language processing	23	
	F	Dec	1	Computer vision	24	#8 due
15	T	Dec	5	Robotics	25	
	F	Dec	8	TBA		

The readings refer to chapters of Russell and Norvig's "Artificial Intelligence: A modern approach." Supplemental readings will be handed out in class as necessary.