CS148
Building Intelligent Robots

Introductory Missive *24 Jan 2001*

CS148 will meet Mondays and Wednesdays from 1-2:30. On Mondays there will be a lecture in Lubrano (CIT 477) and on Wednesdays the format will be more informal, with labs and demonstrations of student work in the MSLab (CIT 167). We will be using the LEGO Mindstorms kits throughout the course, and since these resources are limited, enrollment will be limited to 20 with one kit to each pair of students. Enrollment will be determined by a lottery weighted towards seniors and concentrators; to be eligible to enter the lottery you must attend the first class and fill out the form you will receive there. You will be charged a $25 non-refundable fee as well as a $75 deposit. See the Hardware Fee Agreement handout (you'll get this next week) for specific details.

The current syllabus is available off of the course web page, `www.cs.brown.edu/courses/cs148`. Labs and projects will be posted there as they are assigned, so check it and the course newsgroup, `brown.cs.cs148`, often.

Course Staff (`cs148tas@cs.brown.edu`)

Professor	Tom Dean (`tld`)
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Class Format

As stated above, there will be a lecture every Monday. The first part of class Wednesday will be devoted to a demonstration of the previous week's project, and the second half will be a lab focusing on new material.

Prerequisites

CS 4 or CS 15/16 or CS 17/18.

Labs and Projects

Starting in the second week of the semester there will be a lab and project every week for six weeks. The handout, which you will receive each Monday, will tell you what to do to prepare for Wednesday's lab, in addition to describing the requirements for both the lab and the project. The lab should be finished by the end of class Wednesday, and the project, along with a writeup describing your work, will be due before class the next Wednesday.

The midterm project, RoboSoccer, will last two weeks and be due just before spring break. The final, an open-ended project, will go out after spring break and be due at the end of the semester.

In addition to the labs and projects themselves, you will be required to keep a notebook and turn in writeups of your work.

Notebooks

A notebook is an informal record of your work, comprised of design ideas, difficulties you encounter and the way you work around them, your thoughts about your progress, and diagrams. Keeping a notebook will help you track your thoughts and reflect on your work, which in turn will help you to avoid repeating your mistakes. You should make an entry in your notebook each time you work on your current project.

Writeups

The project reports will be due at the same time as the project itself. Each handout will contain the details of what the report should contain.

Collaboration Policy

You will work in pairs for all of the labs and projects. Unless there are exceptional circumstances, you will work with the same person all semester. For the final, your team may choose to work with another team if you want to do an especially extensive project requiring two RCX bricks. There will be more details about this as the final approaches.

No collaboration is allowed on the notebooks or project reports, not even with your partner. You are encouraged to make notebook entries while you're building and programming your robots, but each partner should have their own notebook containing their own thoughts and ideas.

Although you should discuss your project ideas with your partner, you should write up the reports individually.

Grading

The grade distribution is as follows:

6 labs and projects	30%
midterm	30%
final	40%

The notebook should be kept throughout the semester, and will account for 25% of the final project grade.

Late Policy

You will be allowed one 'late day' on your labs. If you miss lab for some reason, you will be able to come to hours some time within the following week and make it up. It must be completed before class on Wednesday. After you use your one late day, a missed lab means no credit.

Projects will not be accepted late.

NQC Software

The LEGO Mindstorms kits come with a visual programming tool called RIS. You are welcome to play around with this if you would like, but for the course we will be using a more traditional language called NQC. The software is free and is available for Windows, Mac, and Linux. The site where you can download this software is linked off of the course web page. During the labs we will be using the MS Lab (CIT 167), and as soon as enrollment is finalized, you will have card access to the lab.

LEGOs

On Wednesday, January 31, in return for your fee and deposit, you will be given a LEGO kit which includes:

- RCX brick
- two motors
- two light sensors
- two touch sensors
- two rotation sensors
- infrared port and cable
- four short wires
- two long wires
- LEGO plier
- starting set of batteries (6 AA, 1 9V)
- a plastic container for storing your robot

Because of the difficulty of keeping track of the smaller LEGO pieces, you will not be able to take these home except when they are part of your robot. You will only be able to build when you are at the CIT, either in lab or at TA hours.

Hours

Hours will be held in the atrium on the fourth floor. You will have card access by early next week, after enrollment has been finalized. During hours, the LEGOs and one Mac with NQC software will be available for use. To give you more time to work on building your robots, there will also be times when the LEGOs and Mac are available but the ta present will not be on hours.

The schedule is available off the course web page. Please let us know if the current times don't work or if more hours on certain days would be better. We don't want to be holding hours when no one can take advantage of them, so feedback (sent to `cs148tas@cs.brown.edu`) would be appreciated.

Required Books

- Braitenburg: *Vehicles: Experiments in Synthetic Psychology*, MIT Press, 1998.
- Baum: *Dave Baum's Definitive Guide to LEGO Mindstorms*, Apress, 2000.

Supplementary Books

- Knudsen: *The Unofficial Guide to LEGO Mindstorms Robots*, O'Reilly, 1999.
- Murphy: *An Introduction to AI Robotics (Intelligent Robotics and Autonomous Agents*, MIT Press, 2000.