CPSC 422 General Information

The University is a community united by a commitment to studying and learning. Basic to the survival of our community are the principles of academic freedom, respect for each other, and equality of opportunity for all. Any form of harassment to students or other persons (including harassment on the basis of sex, race, religion, sexual orientation, or ethnic background) is a threat to these principles, and will not be tolerated.

Read this sheet carefully, and save it for future reference.

Lectures	Tuesdays and Thursdays 14:00–15:15, Dempster 110
Course web page	`http://www.ugrad.cs.ubc.ca/spider/cs422/`
WebCT course page	`http://www.webct.ubc.ca/SCRIPT/cpsc_422_term2/scripts/serve_home`
Course newsgroup	`ubc.courses.cpsc.422`
Instructor	David Poole
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Office Hours	to be announced (see web page)
Teaching Assistants	Michael Chiang mchc@cs.ubc.ca
	Frank Hutter hutter@cs.ubc.ca

Course Objectives

Intelligent Systems:

Building on material from CS 312 and CS 322, this course explores the science and technology developed for designing and implementing intelligent systems. Essentially, CS 322 developed a logical approach to agent design in the Good Old Fashioned Artificial Intelligence and Robotics (GOFAIR) model. In GOFAIR we assume that there is a single agent operating in a completely (pre-)known, deterministic environment where there are no other actors. We move beyond that by systematically lifting those restrictions so we need to deal with vague, incomplete, uncertain, possibly incorrect, beliefs about the world where there may be several other agents. The course will take a logical, agent-centered approach to these issues.

We will be using a logical language *CIlog* that is designed for building knowledge-based systems as well as *Prolog* and the *CIspace* applets. *CIlog* and Prolog are available on the undergraduate servers and also available for home PCs.

The topics we will cover include:

- Building situated robots, hierarchical control
- Sequential decisions, Markov decision processes,
- Reinforcement learning

- Knowledge engineering tools and how to build them
- Assumption-based reasoning: abduction and default reasoning; diagnosis and design;
- CSPs revisited. Duals, variable elimination algorithm.
- Using uncertain knowledge: probability, Bayesian belief networks, inference, learning belief networks, dynamic belief networks, perception, hidden Markov models
- Decision making; utility, decision networks,
- Ontologies, semantic web, OWL

The prerequisites for this course are CPSC 322 and CPSC 312.

Textbooks and materials

The course text is

- D. Poole, A. Mackworth and R. Goebel, *Computational Intelligence: A Logical Approach*, Oxford University Press, 1998.

The text is available from the bookstore. Additional notes will be provided for parts not in the textbook.

As in all CS courses, print coupons will be required to cover the costs of printing in the lab. See http://www.ugrad.cs.ubc.ca/labs/facilities/acct/print.html for details.

Much of the resource material for the course will be available on the web (at the course home page `http://www.ugrad.cs.ubc.ca/spider/cs422/`) and in the WebCT bulletin board. Please use the newsgroup for general issues (e.g., buying and selling textbooks) and the WebCT bulletin board for content-related issues. You will need to read these regularly. Students should also read `ubc.cs.undergrad` and `cs.gripe`.

Lectures

The course material will be covered primarily in the lectures. You should read the appropriate sections of the text prior to attending that lecture, and then review the text again, along with any additional notes you took, after the lecture.

Some of the topics will be a bit difficult. It is therefore absolutely essential that you **ask questions** whenever something is said which you don't understand.

You are required to attend all lectures; if you are unable to attend a lecture because of sickness or similar reasons, make sure you get the notes from a classmate. If you are out of class for an extended period of time because of sickness, see your instructor immediately upon your return in order to determine how to catch up.

Laboratory and Tutorial Sections

CPSC 422 has no scheduled labs or tutorials. Students can use the usual undergraduate Computer Science labs to do homework assignments. All assignments will be able to be done on generic PCs (e.g., running MacOS, Linux or Windows). For details on lab facilities, see the Undergrad Web:

- `http://www.ugrad.cs.ubc.ca/`

We hope to schedule "unofficial" tutorials or review sessions as needed. If you would like such sessions, **please ask** your instructor.

Examinations

There will be one midterm (70 minutes) and a final examination, at the end of the term. Each exam will be closed-book, but you may have one letter-sized sheet of paper (21.6 by 28 cm), on which you may write any notes or soothing mantras you find useful.

The *tentative* date for the the midterm is February 22. This date will be confirmed at least two weeks before the midterm examination.

The final examination will be written on a date to be specified by the Registrar's Office. **Do not make travel plans for times during the examination period until the final examination schedule has been posted.**

If you miss an examination because of sickness or similar reasons, visit the Student Health Service or your physician, and then see your instructor (for an in-class examination) or the Dean of your Faculty (for a final examination). If you visit your own physician, get a note detailing the period during which you were medically incapable to write the exam. Do *not* write an examination if there is a medical factor which might impair your performance.

Final Mark

A tentative grading scheme is given below. Evaluation will be based on a number of assignments, a midterm, an exam and a project. The assignments are designed to teach you concepts rather than assess your knowledge. More detail on the project will be given later in the term.

- 20% for assignments;
- 20% for the midterm;
- 20% for the project
- 40% for the final examination.

In addition, to get a passing mark in the course, you must pass the final examination.

Collaboration

Collaboration among students can play a valuable educational role, but the amount and form of collaboration is subject to limits that vary with the type of work involved. A high standard of scholarship is expected from all students. In general you must acknowledge any help received and reference any resources that you used.

- Homework: you[1] may discuss the assignments with other students but what you submit must be your own work written by you. You must acknowledge any collaboration or any secondary sources you used for the answers you provide. Copying any part of an assignment (from any source, including fellow students, past students, books, professional homework helpers and web sites), without explicit acknowledgment of the source is considered to be plagiarism, which is a serious offense. You must not *share* any code. Any programs required for a homework assignment must be written by you. You may be asked to explain your solution to a question; if you cannot satisfactorily explain how you obtained an answer, we will presume that it is not your work.

[1] For assignments done in pairs or groups, the term "you" refers to the group.

- For the project you may discuss your ideas and your analysis with anyone, but you must explicitly acknowledge who you have discussed it with, and any two students who discuss their projects must be in the same group or do projects on different topics.
- Exams: you may collaborate in studying for (and preparing the allowed notes for) exams, but you may not communicate with any other student during the exams.

Violations of these rules constitute very serious academic misconduct, and they are subject to penalties ranging from a grade of zero on a particular assignment to indefinite suspension from the University. More information on procedures and penalties can be found in the Department of Computer Science Undergraduate Handbook and in the University Calendar. If you are in any doubt about the interpretation of any of these rules, consult the instructor!