This syllabus is a brief summary of the most important administrative information for CISC 260. For complete details, you must read to the course web page: http://research.cs.queensu.ca/home/cisc260/2015w/home.html. The course also has a Moodle area. Students must read the "news" and "general" Moodle forums regularly, as they will contain important information.

Instructor: Margaret Lamb
office: Goodwin 554
office phone: 613-533-6763
home page: http://cs.queensu.ca/home/malamb
office hours: may vary during the semester; refer to home page for current details
e-mail: malamb@cs.queensu.ca

Lecture Times:
Tuesdays 11:30-12:30
Wednesdays 1:30-2:20
Fridays 12:30-1:20
All of our lectures will be in Stirling C.
There will be no lectures during Reading Week (Feb. 16-20).

Pre or Co-requisite: CISC 102 or any first-year course in Mathematics.
Pre-requisite: CISC 124

Calendar Description:
Review of imperative programming features. Introduction to other widely used programming paradigms. Functional programming languages, such as LISP and Haskell. Higher order functions, lazy evaluation, abstract and recursive types, structural induction, symbolic expressions. Logic programming languages, such as PROLOG. Operational interpretation of predicates and terms, proof search, unification, backtracking. Typical applications.

Purpose: This course is designed to introduce students to programming paradigms beyond the imperative paradigm used in courses up to this point. It focuses on the functional and logical paradigms, using the Haskell and Prolog languages. These paradigms and languages will be useful for many students in later courses, but the ideas gained from studying them will be of use in future programming for every student.

Learning Outcomes: By the end of the course you should be able to do the following things:

• in Haskell:
  • write interesting and useful functions in the pure functional subset of Haskell
  • understand the Haskell type-checking system
  • use structural induction to prove properties of simple functions
  • understand and use higher-order functions
  • use and understand "lazy evaluation"

• in Prolog:
  • write facts, rules and queries to solve small problems in Prolog
  • understand and explain the difference between the declarative and procedural meaning of a program
  • use negation and cuts in Prolog functions

• in both languages (and others):
  • use recursion confidently
  • use accumulators in recursive programs to help solve problems and be able to identify situations in which an accumulator would make a recursive function easier to write and/or more efficient.
Textbooks: There are two required textbooks for this course:
- *Prolog: Programming for Artificial Intelligence*, by Ivan Bratko (fourth edition)

Prior to Winter 2013, we used a custom text composed of sections of earlier editions of these two texts (titled *Programming Paradigms*, compiled by R. D. Tennent). If you find a used copy of that custom text, that's an acceptable substitute. If you plan on taking future courses in Artificial Intelligence, you might want to invest in the complete versions of the two texts, though, because the additional material in each might come in handy.

Whatever text you use, you **must read your textbook as assigned.** You can't expect to pick up everything you need for this course just from lectures. Many students find this course difficult and you should make sure you have the resources to handle it.

Course Organization: This course is divided into several topics. For most topics there will be assigned readings from the textbook or other sources and questionnaires on Moodle for students to answer questions about those readings. Lectures will not review the readings in detail but will focus on examples to illustrate the techniques and ideas in the readings and to demonstrate good programming techniques. Students will be given several marked assignments as well as many unmarked practice problems to work on.

Course Schedule: Available on the web page. Students will have adequate warning of all quizzes and assignment dates.

Marking Scheme:
The basic marking scheme is as follows:
- assignments (average after dropping the lowest one): 10%
- quizzes (average of the best 2 of 3): 44%
- final exam: 44%
- Moodle questionnaires: 2%
- total: 100%
- + up to 2 possible bonus points

However, students must achieve a passing grade on their quizzes and final exam (at least 44 out of the 88 points allocated to those marks) to pass the course. For more details about how you will be evaluated, please see the course web page.

Quizzes: At the end of the term I will ignore your lowest quiz mark and use the average of the other two. (So each of your best two quiz marks is worth 22% each.) More details:
- If you have to miss a quiz for any reason, that's the one you drop.
- If you miss a quiz during the term, I will not give you a make-up for it, even if you missed the quiz for a legitimate reason such as an illness. One of the reasons for the "best 2 out of 3" policy is to spare students and myself the logistical problems associated with make-up quizzes.
- If you miss more than one quiz during the term with a legitimate reason for each one, please talk with me and we'll figure out a fair accommodation. However, if you miss one quiz with a good reason such as illness and another for a bad reason such as forgetting to set your alarm clock, you're out of luck.
- If you get high marks on the first two quizzes you are welcome to skip the third quiz on purpose.
- The final exam will be cumulative. So even though you may miss one of the quizzes some of the material covered on the quiz will re-appear later.

Assignments: There will be 7 assignments during the term. Depending on TA hours for marking, one or two of these may be unmarked. I will drop your lowest assignment mark and average the rest to make the assignment portion of your mark. The rules are similar to the rules for quizzes:
- If you do not hand in an assignment for any reason, that's the one you drop.
- If you are unable to hand in two or more assignments with a legitimate reason for each one, please talk with me and we'll figure out a fair accommodation.
- The assignments are not just for marks but to help you learn (which translates to better marks on the quizzes and final exam). So even if you're not able to hand in a polished version of each assignment, it's important to work on every assignment.
Disability Accommodations:
Queen's University is committed to achieving full accessibility for persons with disabilities. Part of this commitment includes arranging academic accommodations for students with disabilities to ensure they have an equitable opportunity to participate in all of their academic activities. If you are a student with a disability and think you may need accommodations, you are strongly encouraged to contact the Disability Services Office (DSO) and register as early as possible. For more information, including important deadlines, please visit the DSO website at http://www.queensu.ca/hcds/ds/.

If you have a disability and require accommodations in this course, please see the course web site for more specific information.

Academic Integrity: For the full statement of Queen's Academic Integrity policy, please see Arts & Science Academic Regulation 1 at http://www.queensu.ca/artsci/academic-calendars/regulations/academic-regulations/regulation-1. You are responsible for familiarizing yourself with these principles, which apply to all Queen's courses.

More details about how Academic Integrity applies to this course may be found on the course web site. Please be warned that this instructor takes Academic Integrity quite seriously and WILL make formal charges if violations are detected. These charges will affect your mark and possibly your status at Queen's.

Tips For Doing Well in CISC 260:
• Read all of the assigned readings carefully and on time.
• Attend lectures regularly.
• Get an early start on the assignments; don't leave them until the last minute.
• Work on practice problems in addition to the assignments. Practice problems for many of the topics in this course will be suggested on the web site. Even though you don't get marks for practice problems, practicing is the best way to make sure you understand the course material and can apply it on your quizzes and exam, which are marked.
• When you have a question or don't understand something, don't be shy about asking! Help is available for you; this is part of what you're paying tuition for. Even the very best students have questions from time to time! It's nothing to be ashamed of. It's part of how we all learn. (Yes, even profs....)
• The instructor's office hours are listed on her home page (link at the beginning of this document). The TA's office hours will begin during the second or third week of classes and information will be posted on the web page and announced on the Moodle news forum.
• The web site also contains many other suggestions about ways to get help with your studies.