



COURSE INFORMATION Fall 2011

60-100 KEY CONCEPTS IN COMPUTER SCIENCE School of Computer Science, University of Windsor

Instructor

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Office Hours – Room 5114: 10am to noon Wednesdays and noon to 1pm Fridays.

Purpose of the course and learning resources

Course outline

The objectives of this course are to excite students' interest in Computer Science and to give students a precise understanding of a number of difficult concepts that are fundamental to modern Computer Science. Topics include: fundamental programming constructs, relational algebra, data types, induction and recursion, syntax, semantics, formal logic, soundness, completeness, and decidability, and complexity.

Lectures and tutorials

Students will have the opportunity to meet with the instructors, with other students, and with teaching assistants through the following:

- Some formal lectures every week – see the university schedule for times/location for your section.
- One one-and-a-half hour laboratory/tutorial session per week – see university schedule for times.
- One-to-one consultations with teaching assistants as required.
- Discussion and interaction with other students through the Internet.

Course notes and web page

Course notes are available from the bookstore for around \$31 (the cost of printing). There is no textbook for this course.

The web page for 60-100 contains lecture slides, assignments, important notices, etc. and is accessible at:

http://cs.uwindsor.ca/~richard/60_100/60_100_welcome.html

Computing resources

The following computing resources will be available for students taking this course:

- A distributed-computing network, accessible through a graphic interface provided by X-terminals and Sunrays located in various labs (see later).
- State-of-the-art parallel-processing Sun Linux compute servers.
- A “functional” programming language called Miranda (see later for more information).

Access to Computing Resources

The computing network can be accessed through Sunrays and X-terminals in the Java-lab. and the X-lab. on the 3rd floor of Erie Hall (open from 9am to 10 pm weekdays), and in an X-lab in room 305 in the West wing of the Leddy Library (open from 9am to 10pm weekdays and 12 noon to 5pm Saturday and Sunday), through PCs in an open laboratory in the Computer Centre, or, for students who have the necessary equipment, from home via the Internet. Students who have difficulties with the network, or who have questions concerning access from home, etc., should first of all contact the Computing Consultants in IT Services, and if they are still in need of advice, should contact the student teaching assistants for this course, whose names and email addresses will be handed out in class.

Teaching assistance provided

- The professor will give lectures and will directly supervise the marking of all tests and exams. The instructor will also be available for consultation after students have first met with teaching assistants and/or lab instructors.
- A number of undergraduate and graduate teaching assistants will be available for several hours each week for one-to-one consultation at times and places that will be announced in class.
- The professor, or a lab instructor, together with a number of teaching assistants will supervise the laboratories/tutorials and mark the group assignments.

Work to be undertaken by students

Preparation for lectures

Attendance at all lectures and tutorials is highly recommended. Some of the concepts covered are difficult and the professor will attempt to present the concepts in such a way as to make them easier to understand. Students should **read the course notes ahead of lectures**. A detailed schedule showing the topic of each lecture is given at the end of this outline. Lectures are not substitutes for student reading. **Students who do not read ahead may find themselves lost in the lectures.**

Individual Assignments

Students should attempt to complete individual assignments by the suggested completion dates. This will help in preparation for the material to be covered in the subsequent lectures. Answers for individual assignments will be made available so that students can revise concepts that were misunderstood, and assess their own progress.

Self-study of the programming language

The concepts covered in this course have direct relevance to the development of software in any programming language. However, we have found that students can understand these concepts better and more quickly if they experiment with them directly in a high-level programming language. We have chosen the pure functional programming language “Miranda” for this task. Miranda is a declarative language and is ideally suited for coding prototypes of algorithms. Programs are typically 5 to 10 times shorter than those written in procedural or object-oriented languages such as C, or Java. Miranda is available on the distributed-computing network and comes with an online manual, introductory notes, and examples. The Miranda environment can be invoked by typing “mira” at the Unix command prompt. Students will be shown how to use the Unix environment and run Miranda programs in the first and second weeks of class. It is important that students login to the computing systems early in the courses and begin experimenting with Miranda. (More info. On the course website).

Students must register in a laboratory section and MUST attend the CORRECT laboratory section if they want to earn marks for group assignments.

Attendance at the laboratory/tutorials is very important in order to gain an understanding of some of the more difficult concepts.

Students will be assigned to groups of 4 or 5 students in the first laboratory. Group assignments will be handed out each week. Your answer should include a clear statement of who was present at the laboratory session. Two group leaders will be assigned to each group each week. It is the responsibility of the group leaders to write up the groups' answer to the assignment for that week, including the names of the group members present.

Revision for test and exams

To facilitate revision for tests and exams, copies of past tests and exams are provided at the end of the course notes. The tests and exams for this offering of the course will have the same format as the tests and exams used from 1997 up to and including the year 2000, and the Fall semesters of 2005 to 2010 (copies of which can be found at the end of the course notes).

Teaching Evaluation

Student Evaluation of Teaching (SET) forms will be administered during the last two weeks of the class schedule.

Weekly Work Schedule

In order to keep up with the work required for this course it is a good idea for students to write down a weekly schedule, such as the following, filling in the time and location column according to which sections you are in and when you can schedule reading time, etc.

Task	Duration (min)	Time	Location
Reading of lecture notes	1 hour		
Lectures	3 hours		
Individual assignment	1.5 hours		
Lab./Tutorial	1.5 hours		
Additional optional tutorial (when available)	1 hour		
Self-study of Miranda	1 hour		
Weekly TOTAL (excluding revision for tests and exam)	8 to 9 hours		

A note: No student will be allowed to take any course at the University more than two times without permission from the Dean. It is important, therefore, to work hard to ensure success at the first attempt at any course.

Evaluation Scheme

Assessment of students taking 60-100 consists of various components. They will be weighted as follows in the calculation of the final grade. Note that class tests are held on Saturdays. The location of the tests and final exam will be announced later.

Group assignments in labs.	10% (marked by the professor or assistant supervising the lab)	
Individual assignments	10%	
Class Test #1	20 %	Saturday 1 st October 12:00 pm – 2:00 pm – 1120 ER
Class Test #2	20 %	Saturday 12 th Nov 12:00 pm – 2:00pm – 1120 ER
Final Exam	40%	Monday 19th December 7:00 pm – 10:00 pm

Students who wish to appeal a class-test, exam, or assignment mark should wait until they have received their final grade at the end of the semester and then follow the procedure outlined in the University Calendar for the appeal of that grade. No remarking of class tests or the final exam will be undertaken unless a formal grade appeal is submitted at the end of the semester after the student has received the final grade for the course. Numerical errors in adding marks on class tests and the final exam will be corrected when identified.

The final letter grade will be calculated from the raw scores using the following table:

≥ 93	<100	A+	≥ 63	<67	C
≥ 86	< 93	A	≥ 60	< 63	C-
≥ 80	< 86	A-	≥ 57	< 60	D+
≥ 77	< 80	B+	≥ 53	< 57	D
≥ 73	< 77	B	≥ 50	< 53	D-
≥ 70	< 73	B-	≥ 35	< 50	F
≥ 67	< 70	C +		<35	F-

Policy on cheating

The professors and teaching assistants for 60-100 will put a great deal of effort into helping students to understand and to learn the material in the course. However, they will not tolerate any form of cheating.

The professors and teaching assistants will report any suspicion of cheating to the Director of the School of Computer Science. If sufficient evidence is available, the Director will begin a formal process according to the University Senate Bylaws. The instructor will not negotiate with students who are accused of cheating but will pass all information to the Director of the School of Computer Science.

The following behavior will be regarded as cheating (in addition to other acts that would normally be regarded as cheating in the broad sense of the term):

- Copying assignments
- Allowing another student to copy an assignment from you and present it as their own work
- Copying from another student during a test or exam
- Referring to notes, textbooks, etc. during a test or exam
- Talking during a test or an exam
- Not sitting at the pre-assigned seat during a test or exam
- Communicating with another student in any way during a test or exam
- Having access to the exam/test paper prior to the exam/test
- Asking a teaching assistant for the answer to a question during an exam/test
- Presenting another's work as your own
- Modifying answers after they have been marked
- Any other behaviour which attempts unfairly to give you an advantage over other students in the grade-assessment process
- Refusing to obey the instructions of the officer in charge of an examination.

Tentative course lecture schedule

Lectures and Week	Lecture Topic
(Lectures 1, 2, & 3) week starting Sept 5th and week starting Sept 12	Introduction to the course. Students must activate their user accounts – see assignment #1. Using the distributed-computing network. Programming: Chapter 2 of notes, pages 3-8.
(Lectures 4 & 5) week starting Sept 19	Programming: rest of Chapter 2 of notes, plus first 4 sides of “An Overview of Miranda” in notes after page 8.
(Lectures 6 & 7) week starting Sept 26	Data and intro to data types: Chapter 3 of notes, pages 9 to 15, and revision of previous years’ class tests #1 (see end of notes).
SATURDAY Oct 1	TEST #1 12 noon to 2:00pm – location TBA
(Lectures 8 & 9) week starting Oct 3	Advanced data types and operations on data: Chapter 4, pages 16 to 31.
(Lectures 10 & 11) week starting Oct 10	Function definition and recursion: Chapter 5 in notes, pages 32 to 38 plus the next non-numbered page.
(Lectures 12 & 13) week starting Oct 17	Languages: Chapter 6 in notes, and syntax of languages: Chapter 7 in notes.
(Lectures 14 & 15) week starting Oct 24	Semantics of languages: Chapter 8 in notes, pages 52 to 57.
(Lectures 16 & 17) week starting Oct 31st	Review of previous years’ class tests #2 (see end of notes).
week starting Nov 7	Revision of material covered so far. Students can ask questions during lectures and labs.
NOTE November 9 th is the last day for voluntary withdrawal	
SATURDAY NOV. 12	TEST#2 12 noon to 2:00pm – location TBA
(Lectures 18 & 19) week starting Nov 14	Induction: Chapter 10 of notes, pages 59 to 69 plus next 2 non-numbered pages
(Lectures 20 & 21) week starting Nov 21	Complexity: Chapter 11 of notes, plus page 70 plus next 2 non-numbered pages
(Lectures 22 & 23) week starting Nov 28	Logic: Chapter 12 of notes, 3 non-numbered pages before page 72.
(Lectures 24 & 25) week starting Dec 5	Revision for Final Exam. In addition to the lectures, additional revision tutorials will also be available through the week for students who wish to attend them
FRIDAY DEC 19th	FINAL EXAM: 7pm – 10pm – location to be announced