

KEY CONCEPTS IN COMPUTER SCIENCE

03–60–100

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Fall 2011

INTRODUCTION

- Welcome & intro to the School of Computer Science
- What to do if you are not enrolled in this class
- Structure of this first lecture
 - Objective of this course
 - Course material, coursework, & evaluation scheme
 - List of concepts to be covered, an example concept
 - Computer and teaching resources
 - What to do next
 - Group laboratories
 - Policy on cheating
 - We are here to help

OBJECTIVE OF THE COURSE

The course covers around 10 important CS concepts.

It is intended to introduce students to the unchanging concepts which form the basis of Computer Science.

Helps with subsequent CS courses and provides a basic understanding of concepts for non-CS students.

Yr 1 F	Yr 1 W	Yr 2 F	Yr 2 W	Yr 3 F	Yr 3 W
60-100	60-141	60-212	60-231	60-311	60-334
60-140		60-214	60-254	60-315	60-367
		60-265	60-256	60-322	
				60-330	

COURSE MATERIAL & WORK

- Course outline — read carefully.
- Course notes — from the Bookstore (approx \$31).
- On-line information and examples for the Miranda Programming language.
- No text book for this course.
- Each week:
 - Read ahead of lectures and do individual assignment.
 - Two lectures each week.
 - Group/lab. assignments Thursday evening.

Evaluation scheme

Individual assignments	10%	help to pace learning, self assessment, and practice for tests & exam
Laboratory assignments	10%	Full marks for good effort
class test #1	20%	
class test #2	20%	
final exam	40%	Cumulative

Students can only request re-marking at the end of the Semester through the Registrar's Office after tentative grades have been posted.

CONCEPTS COVERED

NOTE : Each of these concepts will be covered in detail over a period of one week each.

- Programming
- Data types
- Operations on data
- Recursion
- Syntax
- Semantics
- Induction
- Complexity
- Logic

Example concept: RECURSION

Define the following infinite objects in finite space.

□ ones= [1, 1, 1, 1, 1, ...

□ factorial= { (1,1), (2, 2), (3,6), (4,24), . .

□ Fibonacci= { (1,1), (2,1), (3,2), (4,3), (5,5), (6,8) . .

□ sort

=

{ ([3,4,2,1], [1,2,3,4]),
([14,6,23,8,15], [6,8,14,15,23]),
etc }

FINITE RECURSIVE DEFINITIONS OF INFINITE OBJECTS

`ones = 1 : ones`

`factorial 1 = 1`

`factorial n = n * factorial (n - 1)`

`fib 1 = 1`

`fib 2 = 1`

`fib n = fib (n - 1) + fib (n - 2), if n > 2`

SORTING A LIST OF NUMBERS USING DIVIDE AND CONQUER

```
qsort [] = []
```

```
qsort (x:xs)  
  = qsort [e | e <- xs; e < x]  
    ++ [x] ++  
    qsort [e | e <- xs; e >= x]
```

**All of these definitions
are programs**

COMPUTER FACILITIES

- Network — uses Unix& MS servers, X, NFS, distributed computing
- Unix servers
 - ARC1– Huge Sun server in ITS
 - Sol and Luna — Huge Sun servers in CS
- Points of access
 - PCs with X-ware: basement Computing Services
 - Sunrays on 3rd floor Erie and Lambton Tower
- Applications
 - e-mail, WWW browsers, editors
 - Miranda, Maple, C, C++, Java etc, Oracle,

Teaching Resources

- Approx 150 students taking this class
- Two instructors
- 3 Graduate teaching assistants just for 60–100
- ? Undergraduate assistants just for 60–100
- many lab supervisors scheduled throughout week in all CS labs available to help you with general stuff — logging on etc.

What to do next

Obtain the course notes from Document Services

Read the intro. section of the notes

Activate computing account as soon as possible through web page : **www.uwindsor.ca/uwinid**

Go to ITS or CS labs to check that you have login privileges on ARC1 and Sol.

Learn how to use Sunrays, the editor, and e-mail.

Do individual assignment#1 by deadline

ATTEND THE GROUP LAB NEXT Thursday 15th Sept.

LABORATORIES

- LAB ATTENDANCE IS CRUCIAL
- You must register in a lab if not already done so, **WAIT UNTIL END OF CLASS**
- See me if you want to change the lab time (we cannot guarantee change is possible)

POLICIES ON CHEATING & DISRUPTIVE BEHAVIOR

- Zero tolerance!
- CS professors simply collect evidence and submit to head of department
- CS department head sends to Dean of student affairs with recommendation for maximum penalty if proven
- Attendance at lectures is not compulsory
- Most students are here to learn
- Disruptive students will be given one warning
- Second time — expulsion from the course

WE ARE HERE TO HELP

- Very friendly department
- Very friendly professors
- Very friendly teaching assistants
- Excellent secretaries
- Excellent technical support staff
- We want to get to know every student
- Introduce yourself
- Get involved: other campus activities, work study, professors research (NSERC USRA)