

CSc 225

Algorithms and Data Structures I

Introduction

Jianping Pan

Fall 2007

About the course

- Algorithms and Data Structures I
 - (F01) MWR 2:30-3:30pm, ECS 125
 - <http://www.csc.uvic.ca/~csc225>
 - lectures, tutorials, discussion board, etc
 - prerequisites
 - Programming fundamentals (CSc 115/160)
 - Logic foundations (Math 122/224)
 - or Discrete structures (CENG 245)

Message from Undergrad Advisor

- Jane Guy: ECS 512, jguy@csc.uvic.ca
- Do not have the prerequisite course(s)?
 - need to have a waiver
 - otherwise, prerequisite drop after the first week
- Taking the course more than twice?
 - need to have a letter from the Chair and the Dean
 - otherwise, being dropped from the class
- UVic email accounts used for messages!

About the course instructor

- Dr. Jianping Pan
 - pan@uvic.ca
 - always include [csc225] in your email subject line
 - office hours: MR 1:30-2:30pm
 - or by appointment
 - ECS 566, x5796
 - work experience
 - UVic, industry research labs, UWaterloo, ...
 - research area
 - computer networks and distributed systems
 - network protocols: data structures and algorithms
 - <http://web.uvic.ca/~pan>

About the tutorial instructor

- TBA
 - csc225@csc.uvic.ca
- Tutorials
 - (LF01) M 12 – 1pm, DSB C126
 - (LF02) M 1-2pm, DSB C126
 - tutorial lectures
 - assignment help
 - practice problems
- **Attend your registered session!**

Course materials

- Required textbook
 - **Algorithm Design: Foundations, Analysis and Internet Examples**
 - online resources (errata, slides, hint server, problem db)
 - <http://algorithmdesign.net/>
- Explore further
 - web links @ course web site, Wiki pages, Google!
 - more books
 - <http://theory.lcs.mit.edu/~clr/>
 - <http://www.cs.princeton.edu/~rs/>
 - <http://www.cs.fiu.edu/~weiss/>
 - <http://www-cs-faculty.stanford.edu/~knuth/>

Algorithms and data structures

- Algorithms: a *step-by-step* procedure for solving a problem in a *finite* amount of time
 - searching, sorting, traversing, ...
 - and many more: numerical, combinatorial, ...
- Data structures: a systematic way of *organizing* and *accessing* data
 - boolean, character, integer, real number, ...
 - array, string, structure, union, ...
 - stack, queue, vector, list, tree, graph, ...

Course objectives

- “*Design and analysis* of fundamental algorithms and their data structures.”
- CS=algorithms+data structures
 - time/space analysis and tradeoff
- Selected topics
 - algorithm design and analysis techniques (Ch1/5)
 - data structures (Ch2)
 - searching and sorting algorithms (Ch3/4)
 - graph algorithms (Ch6/7)

Your participation

- Lectures
 - essential for doing well in assignments/exams
- Assignments (30%)
 - 5 written/programming assignments
- Tutorials
 - extra details and hints on assignments
- Exams
 - midterm (20%); final (50%)
- See the course outline for schedules

Suggested approach

- Before lectures
 - read textbook; find questions
- Attend lectures
 - take notes; ask questions!
- After lectures
 - read textbook; explore further
 - write assignments (start early!)
 - get help and help others (discussion board)
- Attend tutorials

Common *mistakes*

- “Slides are already online”
 - Lectures are much more than just browsing slides
 - Pay attention to in-class questions/discussion too!
- “Slides are too brief”
 - Slides are just guidelines to navigate/understand
 - Take notes in class and read the textbook!
- “Start to do assignments on the due date”
 - Simple fact: you cannot finish them
 - Start early and let us know if you have questions!

Follow-on courses

- CSC320: Foundations of Computer Science
- CSC326: Algorithms and Data Structures II
- CSC425/520: Analysis of Algorithms
- CSC426/526: Computational Geometry
- CSC428/528: Computational Biology
- CSC521: Parallel Algorithms
- CSC522: Graph Algorithms
- CSC523: Randomized Algorithms
- CSC524: Computational Complexity

CSC225 is a foundation course

- CSC225 is a prerequisite for
 - Computer Graphics (CSC305)
 - Foundations of Computer Science (CSC320)
 - Algorithms and Data Structures II (CSC326)
 - Programming Languages (CSC330)
 - Computer Architectures (CSC350)
 - Operating Systems (CSC360)
 - Computer Networks (CSC361/450)
 - Database Systems (CSC370)

Your feedback

- Teaching/learning is interactive
 - two-way communications
- Let me know
 - what you think about lectures, assignments, tutorials, exams, topics, ...
 - what you want to know more or probe further
- You can *always* reach me
 - in class, during office hours, by email/phone

Course policies

- See official course outline
 - late assignments, mark appeals, etc
 - academic integrity
 - zero tolerance on cheating!
 - accommodation, etc
- No group assignment/project
 - collaboration/participation is encouraged
 - responsibility: your submitted work is yours
 - obligation: give credits to references

Assignment 0

- Due on Friday, Sept 7th, 2007
- Send an email to `pan@uvic.ca`
 - From `you@uvic.ca` (or `you@csc.uvic.ca`)
 - Subject: `[csc225] A0`
 - name, student number, academic program
 - things you want to know in algorithms
 - issues with course logistics
 - any other questions on the course
 - a URL to your mug shot
 - let me know you!

This lecture

- An introduction to the course
 - who, when, where, what
 - course materials
 - course objectives
 - course topics
 - you and the course

Next lecture

- Algorithm analysis techniques
 - read AD Chapter 1