COMP 2710 Software Construction

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Goal and Objectives

Goal: Compete for positions in the job market or in graduate schools.

Objective 1: Grasp both C++ Syntax and Semantics

Objective 2: Design, implement, and test software

Programming skills

Software design skills

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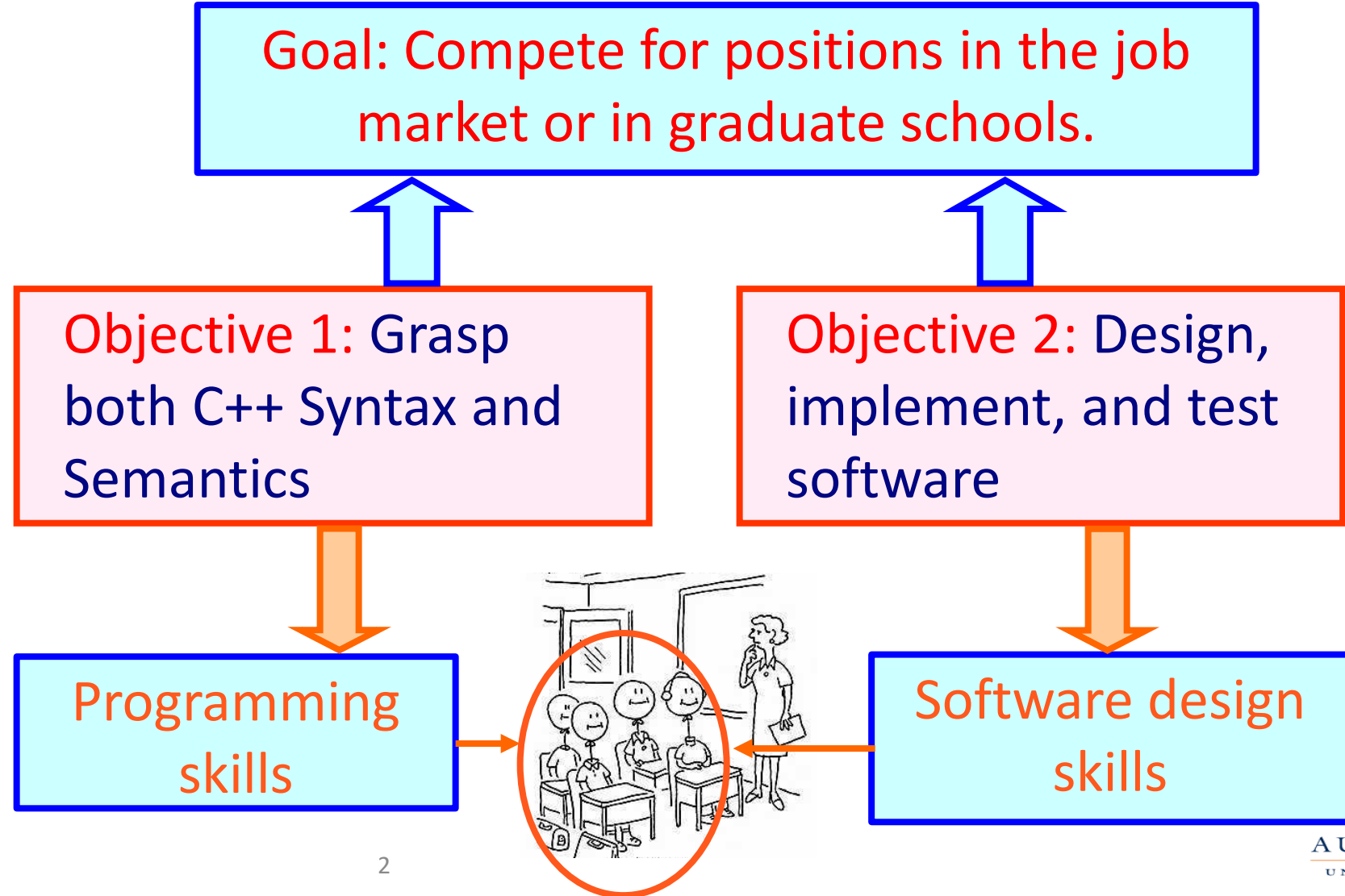
Your Future Career

Careers: Comp. Sci & Eng., Electrical Eng.

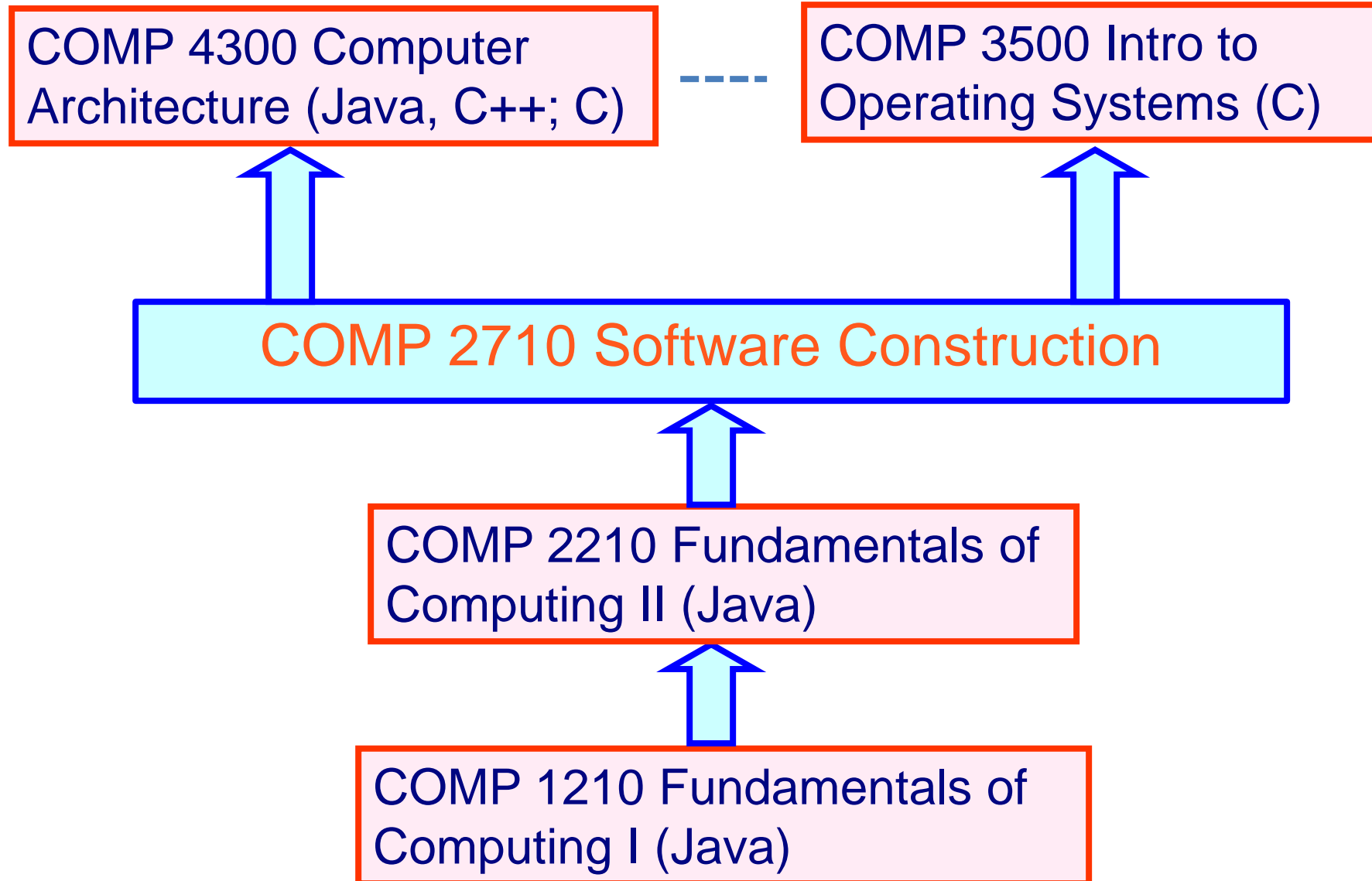Phone and On-site Interviews

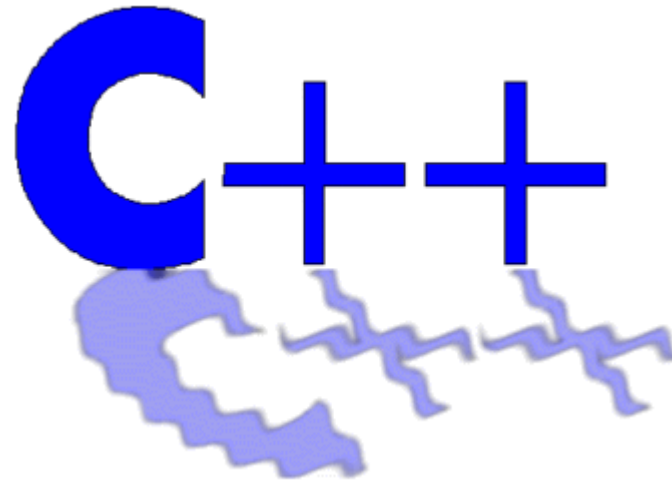Programming skills   Problem solving skills   Personality

Quickly learn a new programming language

Programming experience

Why Study Software Construction?
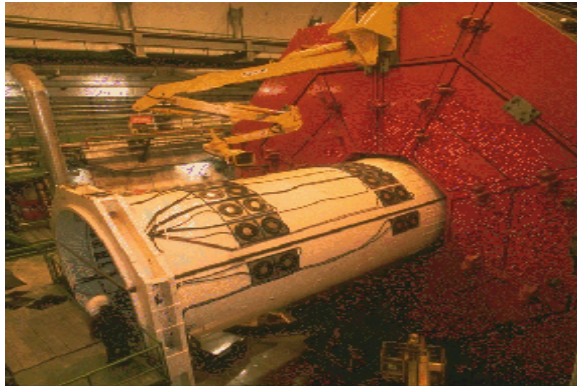
C++ Application

- **Adobe Systems**:

All major applications are developed in C++:
- Photoshop & ImageReady,
- Illustrator,
- Acrobat,
- InDesign,
- GoLive,
- Frame (mostly C, some C++)

C++ Applications (cont).

- **Amazon.com**: Software for large-scale e-commerce.
- **Google**: web search engine, etc.
  - Chromium browser.
  - Google file system.
  - MapReduce large cluster data processing.
- **HP**: Here is a tiny fraction of HP's C++ apps:
  - C, C++, Fortran90 compilers, and linker for the new HP IA64 platform (these add to more than 1 million lines of C++ code).
  - SAM (HP's system management utility)
  - Some of the networking libraries in HP-UX
  - Java VM core
- **IBM:**
  - OS/400.
  - K42: a high performance, open source, general-purpose operating system kernel for cache-coherent multiprocessors.

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Parallel Applications on Supercomputers

Why Study Software Construction?

amazon

Position	Software Engineer
Location	Seattle, WA
Company	Amazon
Part of the Job Description	Basic Qualifications * Bachelor's Degree or better in Computer Science or related field. * 4+ years professional experience in software development. * Computer Science fundamentals in object-oriented design, problem solving, data structures and algorithm design * Proficiency in, at least, one modern programming language such as C++, C# and Java. Perl experience a plus.

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Position	Software Test Specialist
Location	San Jose, California
Company	IBM
Part of the Job Description	Applicant should possess a strong programming language such as C, **C++** or Java. Command of a non-Windows platform such as Linux or UNIX is also a plus. The applicant should possess any number of the following abilities: Java, **C++,** C, **Linux**, Windows, TCP/Networking, Websphere, DB2, Rational Tools, Project Management.

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| Position	Senior Software Engineer
Location	Washington, DC
Company	Intel
Part of the Job Description	You should possess at least a Bachelor of Science degree and possibly more advanced degrees with extensive experience as graphics programmer in the video game industry. Additional qualifications include: - Solid understanding of Direct X*, OpenGL*, and Shaders* - Strong experience with C/C++ language and Windows* development environment - A good communicator and comfortable with public speaking - Multithreading experience and computer architecture knowledge would be an added advantage

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Position	Software Engineer, Compilers
Location	Mountain View, CA
Company	Google

Part of the Job Description	Responsibilities:
	    * Performance analysis
	    * Development of advanced tools
	    * Implement state of the art compiler optimizations
	    * Integration into the GCC public repository
	
	Requirements:
	    * Comprehensive and recognized knowledge in compilers, optimization technology, and algorithms
	    * Deep understanding of computer architecture
	    * Strong debugging/analytical skills
	    * **Solid practical C/C++ experience**

Why Study Software Construction?
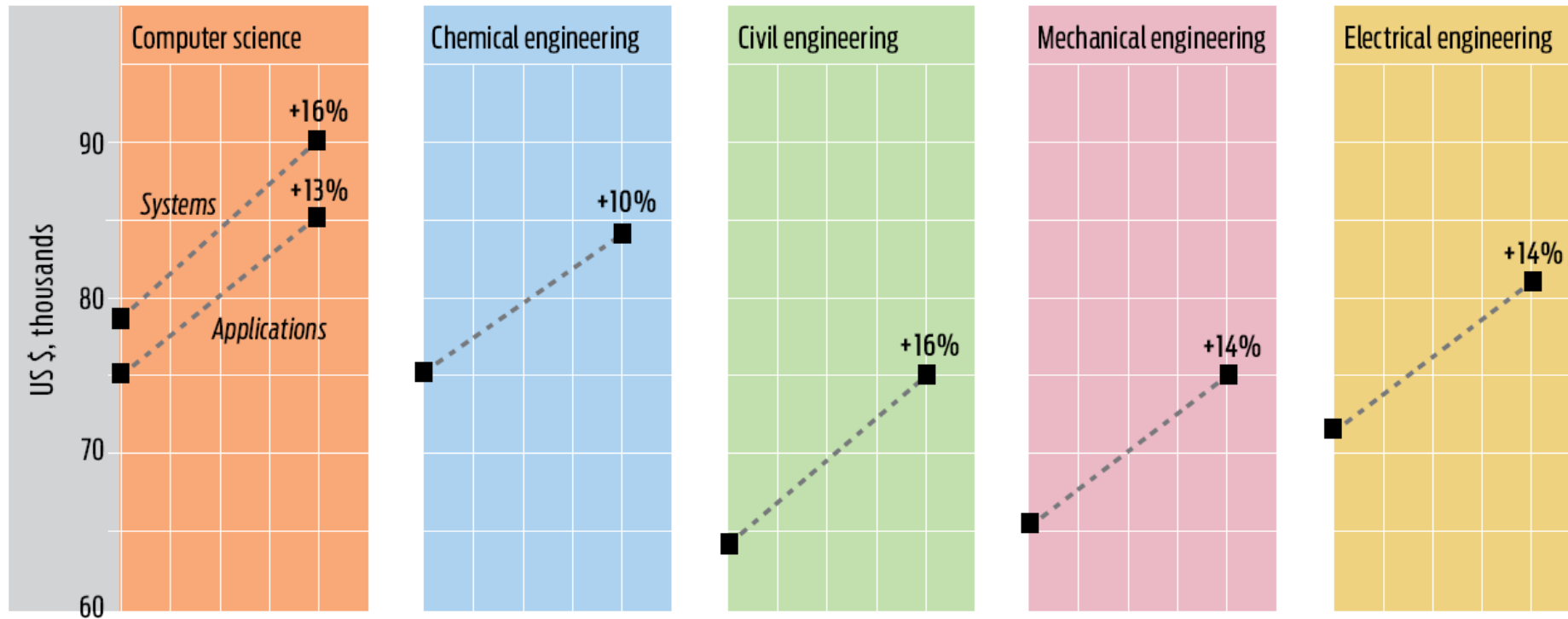
What will you get out of COMP2710?

- Analyze problems to determine system requirements

- Develop object-oriented software designs that map to requirements identified in analysis

- Develop software using sound programming principles

- Grasp both C++ Syntax and Semantics

- Have experience in developing non-trivial software applications

- Understand concepts of data abstraction, efficiency, and memory management

- Understand how to perform software testing.

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Topic Coverage (Outdated)

- I/O: Basic, File

- Functions: Basics, Overloading, Templates

- Arrays

- Structures & Classes: Basics, Constructors

- Vectors and Iterators

- Operator Overloading

- Strings and Streams

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Your Programming Environments

- Do you have a laptop?

- What operating systems are installed on your laptops? Windows, Mac OS, Linux?

- Do you use Linux command lines?

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Programming Environment Setup