# CS453 Compiler Construction

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Office hour: Monday 1-2pm  
Lab hour: Wed 3-4pm

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**URL:** [http://www.cs.colostate.edu/~cs453](http://www.cs.colostate.edu/~cs453)

Send around sheet to collect email addresses and CS linux account names.

## Course Logistics (Highlights, see web page for more detail)

**Progress Page and Home/News**  
Read both of these daily.

**Syllabus and Grading**

**Professional Conduct**  
Do your own work.  
Act like a professional in the lab.

**Participate**  
Come to class and recitation.  
Come to lab and office hours.  
Provide anonymous feedback online.
Plan for Today

Course Logistics

15-minute compiler

Compilers class and reality
   – Why study compilers?

Interpreter and Compiler Structure, or Software Architecture

Overview of Programming Assignments
   – The MiniSVG interpreter and MeggyJava compiler we will be building.
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Structure of a Typical Compiler
MiniSVG Renderer

<svg xmlns="http://www.w3.org/2000/svg">

<!-- rectangles -->
<rect x="20" y="20" width="300" height="250" fill="red" />
<rect x="30" y="20" width="300" height="250" fill="blue" />
<rect x = "40" y = "20" width = "300" height = "250" fill = "green" />

<!-- white circle on top of rectangles -->
<circle cx="120" cy="150" r="60" fill="white" />

<!-- black diagonal line -->
<line x1="0" y1="0" x2="300" y2="300" stroke="black" />

</svg>
Example MeggyJava program

```java
import meggy.Meggy;

class PA3Flower {
    public static void main(String[] whatever){
        {
            // Upper left petal, clockwise
            Meggy.setPixel( (byte)1, (byte)1, Meggy.Color.WHITE );
            Meggy.setPixel( (byte)2, (byte)1, Meggy.Color.WHITE );
            ...
        }
    }
}
Structure of the MeggyJava Compiler

Analysis
- character stream
  - lexical analysis
  - tokens → “words”
  - syntactic analysis
  - AST → “sentences”
  - semantic analysis

Synthesis
- code gen
  - Atmel assembly code
    - PA2: MeggyJava and Atmel warmup
    - PA3: setPixel compiler
    - PA4: add control flow
    - PA5: add functions
    - PA6: add variables and objects
    - PA7: add arrays

AST and symbol table

Before Next Time

Sign up for the mailing list at
- [http://groups.google.com/group/cs453-spring-2011](http://groups.google.com/group/cs453-spring-2011)

Read Ch 1 and skim Ch 2 through 2.6

Start working with the MiniSVG start up code
- You should at least step through the existing code with a debugger before Thursday’s class

Send email to mstrout@cs.colostate.edu if you would like to help put together Meggy Jr devices this Sunday
- 2-3pm in rm 425
- Will only be able to accommodate the first 8 students
- Will open it up for grad students and other undergrads on Thursday
- We will have one other session sometime next week Tuesday or Thursday night