

CSE 756
Compiler Design and Implementation
Spring 2011
Syllabus

Instructor: Atanas (Nasko) Rountev

Course Summary

Lexical and syntax analyses using compiler generation tools; intermediate code; control-flow analysis; dataflow analysis; code optimizations; code generation. Students write compiler components.

Objectives

- Master using lexical analyzer and parser generation tools
- Master generating intermediate code
- Master control-flow and dataflow analysis
- Master code optimizations
- Be familiar with compiler architecture
- Be familiar with generating assembly code
- Be familiar with allocating registers

Prerequisites

CSE 625: Introduction to Automata and Formal Languages; CSE 655: Introduction to the Principles of Programming Languages; CSE 680: Introduction to Analysis of Algorithms and Data Structures; Working knowledge of C++

General Information

- Credits: 4
- Instructor: Atanas (Nasko) Rountev, routtev@cse.ohio-state.edu
- Instructor's office hours: DL 685, Tuesday and Wednesday 1:00 – 2:00, or by appointment
- Grader: Bin Ren, ren@cse.ohio-state.edu
- Grader's office hours: DL 778, Tuesday and Wednesday 11:00 – 12:00 or by appointment
- Course web page: <http://www.cse.ohio-state.edu/~routtev/756>

Topics

- Lexical analysis
- Syntax analysis
- Intermediate representations
- Control-flow analysis
- Dataflow analysis
- Code optimizations
- Code generation

Reading

The required textbook for this course is *Compilers: Principles, Techniques, and Tools, Second Edition* by Alfred V. Aho, Monica S. Lam, Ravi Sethi, and Jeffrey D. Ullman, published by Addison-Wesley in 2007. This book is commonly referred to as the “dragon book” due to the illustration on the cover. Do *not* confuse this with the first edition of the dragon book from 1986, authored by Aho, Sethi, and Ullman. The book will be available on reserve at the Science and Engineering Library.

In addition to the book, your most important reading will be the lecture notes and your own notes. Copies of all notes will be handed out in class, and will also be available on the course web page. For each topic, I will give you pointers to relevant parts of the books.

Course Web Page

<http://www.cse.ohio-state.edu/~routtev/756>: the course web page will contain all notes, handouts, assignments, a detailed schedule, pointers to reading materials, etc. Copies of assignments etc. handed out in class become official, independent of whether they are on the web page or whether you are able to access the page.

Projects

- There will be several programming projects, which have to be submitted electronically on `stdsun` by midnight on the due date. Except for the first two projects, all other projects will be implemented on `stdlogin`. These projects *must* compile and run on `stdlogin`. If you decide to use a different machine, it is **entirely** your responsibility to make the code compile and run correctly on `stdlogin` before the deadline.
- The projects should be done independently from other students in the class. General discussion of the projects with others in the class is allowed, but you have to do all the design, programming, and testing independently. Projects that show excessive similarities will be taken as evidence of cheating and dealt with accordingly.
- The projects are due by 11:59 pm on the due day. **Absolutely no exceptions** will be made to this deadline: if you submit at 12:00 am, your submission will be considered to be late. The time stamp on the electronic submission will be used to determine the submission time. A reduction of **10% per day** will be applied to late submissions. Submissions more than three days late will **not** be accepted.

Exams

- There will be a final exam, at the standard time determined by the university. It will be comprehensive, in-class, closed book. You will be allowed to use a *cheat sheet* — one standard-sized piece of paper, with notes on both sides.
- Missing the final without prior written (e-mail) approval from me will result in a score of zero for that exam. To get my approval to reschedule the exam, e-mail me **at least one week** before the exam is scheduled. I will not give such approval unless the reasons are justifiable.

Grading

Projects	75%
Final	25%

Grading Policy

The entire course will be graded on a curve. I expect the average grade to be around B+. For this reason, I will deduct points rather liberally and I will encourage the grader to do the same. Keep this in mind if you get a score that you consider to be relatively low. Of course, when grading on a curve the absolute score is not important. For the projects, I will provide statistics that will help you understand your standing in the class.

The course policy is that **whoever graded something will be responsible for handling grading disputes**. I will grade the final exam. The grader will grade the projects. Grades become final one week after a project is handed back. This should leave plenty of time to resolve grading disputes with the grader.

Honesty

I will treat you as professionals, and you should conduct yourselves as such. You are free to discuss the projects with others. However, the solutions you submit should be developed **entirely** by yourself. **Cheating is a very serious offense and will not be tolerated**. Supplying others with materials is also against this rule. Additional details on academic integrity are available at <http://oaa.osu.edu/coamresources.html>.

Students with Disabilities

Any student who feels he or she may need an accommodation based on the impact of a disability should contact me privately to discuss his or her specific needs. Please contact the Office of Disability Services at (614) 292-3307, or visit 150 Pomerene Hall, to coordinate reasonable accommodations for students with documented disabilities.

Religious Obligations

I will do my best to accommodate any religious obligations you may have. Please contact me privately, at least a week in advance, to work out any relevant details.