

22C:186 Compiler Construction

Syllabus

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Class hours: TTH, 2:30–3:45pm, 117 MH

Office hours: TTH, 3:50–4:50pm, 201J MLH

Note: This course is given by the College of Liberal Arts and Sciences. This means that class policies on matters such as requirements, grading, and sanctions for academic dishonesty are governed by the College of Liberal Arts and Sciences. Students wishing to add or drop this course after the official deadline must receive the approval of the Dean of the College of Liberal Arts and Sciences. Details of the University policy of cross enrollments may be found at: <http://www.uiowa.edu/provost/deos/crossenroll.doc>

Instructor note: Copying material from any source and using it without citation as one's self work is an academic dishonesty and, depending on its gravity, can be subject of a penalty within a range of punishments from zero credit for the copied work until exclusion from the program.

1 Purpose

The purpose of the course 22C:186, Compiler Construction, is to introduce the student to the compiler construction. We shall accomplish this purpose by following a mathematical methodology for compiler construction based on formal definitions of source and target languages of a compiler. This will be achieved by a hands-on machine approach using compiler construction tools developed in the framework of the TICS project by researchers in the Department of Computer Science of the University of Iowa. These tools are written in C and were installed on Unix machines. The Spring 2006 offering of Compiler Construction will be used as a test-bed for the implementation of a language developed by Ted Herman and his collaborators for distributed computations.

2 Textbooks and topics

The textbook used for this offering of Compiler Construction is COMPILERS – Principles, Techniques, and Tools Edition 2, ISBN 0-321-42890-0, Addison-Wesley, 2006 (known as Dragon Book). But since this edition of Dragon Book is not yet published, the new material is available on the web using an access card given to the student by the bookstore when she or he buys the textbook. However, the basic support for this offering of Compiler Construction

will be the instructor's lecture notes, which will serve as user manual for TICS tools for compiler construction. These lecture notes will be available from the web site of the course at the address <http://www.cs.uiowa.edu/~rus>. In addition, reference books on compiler construction, written by authors with a great experience in this field, will be available from MLH library.

Topics to be covered in this offering of Compiler Construction are available by clicking on "Contents" on the web site of the course. The percentage of these topics in previous offerings are:

1. The compiler: a general view, 5%.
2. Mechanisms for source language specification, 5%.
3. Mechanisms for target language specification, 5%.
4. Compiler specification, 10%.
5. Lexical analysis, 10%.
6. Syntactic analysis, 10%.
7. Semantic analysis, 20%.
8. Code generation, 20%.
9. Error recovery 5%.
10. Code optimization 10%.

The student's interest in one topic or another may change these percentages in the current offering.

The student grades in this class will be based on student appraisal on assignments, projects, midterm, and final. Each of this work categories will consists on solving concrete problems raised by the implementation of the language used as our test-bed.

3 Grading Procedure

The student assessment in this course will be obtained from the appraisal of student scores in assignments, projects, midterm exams and the final exam. There will be one midterm exam and one final exam. The exams in this class are usually take home. The midterm exam is scheduled for Thursday, 9 March 2006. The final exam will be comprehensive and its date will be announced later. The student's final result will be determined by the following procedure:

1. Assignments and class attendance are 15% of the final grade.

2. Projects and in class presentations are 25% of the final grade.
3. Midterm result is 30% of the final grade.
4. The final exam is comprehensive and is 30% of the final grade. By definition, a student who does not attend the final exam loses all the points accumulated from the other sources and will be graded with an F.

The grades are determined as follows:

1. An A is obtained if $90 < \text{Final Result} \leq 100$.
2. A B is obtained if $70 < \text{Final Result} \leq 90$.
3. A C is obtained if $50 < \text{Final Result} \leq 70$.
4. A D is obtained if $30 < \text{Final Result} \leq 50$.
5. An F is obtained if $0 \leq \text{Final Result} \leq 30$, or if the student does not attend the final exam.

These ranges are not absolute. However, the lower limits will not be raised any higher; + and - will be used along with the letter scores in the final result.

Good luck!