CSE 4305/5317
Design and Construction of Compilers
Spring 2010

Administrivia:

Instructor: Prof. Nathaniel Nystrom
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Class Time: Tuesday, Thursday 2:00-3:20pm
Class Location: NH 110

Web: http://ranger.uta.edu/~nystrom/courses/cse4305-sp10

Catalog description: Review of programming language structures, translation, and storage allocation. Introduction to context-free grammars and their description. Design and construction of compilers including lexical analysis, parsing and code generation techniques. Error analysis and simple code optimizations will be introduced.

Student Learning Outcomes: By the close of the course, the successful student will be able to:

- Describe the structure of a typical compiler.
- Implement a scanner and parser.
- Understand compiler optimizations.
- Understand principal compiler data structures, including environments and symbol tables.
- Understand the implementation of common features of programming languages.

Prerequisites: CSE 3302 (Programming Languages). In particular, it is assumed that you have a working knowledge of the following subjects: functions and relations, Boolean algebra, graphs and graph algorithms, predicate logic, automata and formal languages, and program complexity. You must also have a working knowledge of basic data structures, including stacks, queues, dequesues, and graphs. This background is necessary to understand portions of the material, and chances of passing the course without the required background are slim.

Books:

The required textbook is Modern Compiler Implementation, 2nd edition, by Andrew Appel and Jens Palsberg. Some helpful references include:

- Aho, Lam, Sethi, Ullman, Compilers (aka “The Dragon Book”)
- Jones, Garbage Collection

Assignments: There will be three written homework assignments and one group programming project, broken into six parts. Groups of 3–4 will implement a compiler for a small object-oriented language.

Exams: There are two exams, a midterm exam in March and a comprehensive final exam in May. Both exams are open book and open notes.

If you are unavailable for an exam, please contact me as early as possible to make other arrangements. Make-up exams will be given only under dire circumstances (illness, death in the family).
**Grading Policy:** Grades will be weighted as follows:

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<thead>
<tr>
<th>Component</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Assignments</td>
<td>20%</td>
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<tr>
<td>Projects</td>
<td>40%</td>
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<tr>
<td>Midterm exam</td>
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<td>Final exam</td>
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**Late Policy:** Assignments should be turned no later than their deadline; assignments late by \( n \) days will be penalized \( \max(100, 10 \cdot 2^{\lfloor n \rfloor}) \) percent. If you are unable to complete an assignment on time, please contact me as early as possible to make other arrangements.

**Email Policy:** Class-related email should be sent to nystrom@uta.edu. The subject line must include “S317” or the email will be lost. The subject must contain the appropriate identifier if it is a lab or paper turnin. Emails sent to the wrong address or without proper classification in the subject will be deleted before being read. Do not send me MS Word documents—I will not read them. Plain text is best. If you want to send me a formatted document, use PDF or HTML.
Drop Policy: Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. Students will not be automatically dropped for non-attendance. Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. Contact the Financial Aid Office for more information.

Americans with Disabilities Act: The University of Texas at Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including the Americans with Disabilities Act (ADA). All instructors at UT Arlington are required by law to provide “reasonable accommodations” to students with disabilities, so as not to discriminate on the basis of that disability. Any student requiring an accommodation for this course must provide the instructor with official documentation in the form of a letter certified by the staff in the Office for Students with Disabilities, University Hall 102. Only those students who have officially documented a need for an accommodation will have their request honored. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability or by calling the Office for Students with Disabilities at (817) 272-3364.

Student Support Services Available: The University of Texas at Arlington has established a variety of programs to help students meet the challenges of college life. Support to students includes advising, counseling, mentoring, tutoring, supplemental instruction, and writing assistance. For a complete list of academic support services, visit the Academic Assistance resource page of the Office of Student Success Programs, www.uta.edu/uac/studentsuccess/academic-assistance. To help students address personal, academic and career concerns, individual counseling is also available. For more information, students are encouraged to contact Counseling Services www.counseling.uta.edu at (817) 272-3671 or visit a counselor in 216 Davis Hall.

Academic Integrity: It is the philosophy of The University of Texas at Arlington that academic dishonesty is a completely unacceptable mode of conduct and will not be tolerated in any form. All persons involved in academic dishonesty will be disciplined in accordance with University regulations and procedures. Discipline may include suspension or expulsion from the University. According to the UT System Regents Rule 50101, §2.2, “Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.”

For written assignments, I expect each student to write up his or her answers individually. You may not copy solutions or code. You should not look at each other's code. Plagiarism will not be tolerated. However, you should feel free to discuss assignments with other students, and you may certainly ask a colleague to proofread or comment on your answers. When handing in your assignments please give credit to anyone who helped you. Cite your sources.

Collaboration of any kind is not permitted on exams.

Electronic Communication Policy: The University of Texas at Arlington has adopted the University “MavMail” address as the sole official means of communication with students. MavMail is used to remind students of important deadlines, advertise events and activities, and permit the University to conduct official transactions exclusively by electronic means. For example, important information concerning registration, financial aid, payment of bills, and graduation are now sent to students through the MavMail system. All students are assigned a MavMail account. Students are responsible for checking their MavMail regularly. Information about activating and using MavMail is available at http://www.uta.edu/oit/email/. There is no additional charge to students for using this account, and it remains active even after they graduate from UT Arlington.