CSE 3302
Principles of Programming Languages
Spring 2010

Administrivia:

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Office Hours: Wednesday 4–6pm (or by appointment)
Email: nystrom@uta.edu
Class Time: Tuesday, Thursday 11:00-12:20pm
Class Location: GACB 105
Web: http://ranger.uta.edu/~nystrom/courses/cse3302-sp10

Catalog description: Introduction, analysis, and evaluation of the important concepts found in a variety of programming languages. Formalisms useful in specifying language syntax and semantics; programming language paradigms such as algorithmic, functional, logic, and object-oriented. Prerequisite: CSE 2320.

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

- Describe the general principles that involved in the design of programming languages.
- Explain the relationship between syntax and semantics as well as the differences between the two.
- Describe the principal features of different programming language paradigms.
- Explain programming language concepts such as binding, naming, scopes, storage, control structures, functions, calling conventions, and exceptions and their interactions.
- Explain how a variety of programming language constructs are implemented.
- Describe the structure of a typical compiler and interpreter.

The successful student will also have:

- Experience with programming in several different programming languages.
- Examined principal compiler data structures, including environments and symbol tables.

Prerequisites: CSE 2320 (Algorithms and Data Structures). 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, 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 Programming Language Pragmatics, 3rd edition, by Michael L. Scott. Some helpful references include:

- Andrew Appel and Jens Palsberg, Modern Compiler Implementation in Java
- Benjamin C. Pierce, Types and Programming Languages
- Martin Odersky, Lex Spoon, Bill Venners, Programming in Scala
- Simon Thompson, Haskell: The Craft of Functional Programming
- Leon Sterling and Ehud Shapiro, The Art of Prolog
Assignments: There will be six homework assignments. Many assignments will also have a small program-
ning component, typically writing a small program in a language discussed in class or implementing part
of an interpreter for a small language; much of the code will be provided. In addition to the six homework,
there will be also be one essay assignment.

Assignments should be typed or written neatly. I won't grade assignments I can't read.

Assignments should be turned in 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.

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:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Assignments</td>
<td>50%</td>
</tr>
<tr>
<td>Essay</td>
<td>10%*</td>
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<tr>
<td>Midterm exam</td>
<td>20%</td>
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<tr>
<td>Final exam</td>
<td>20%</td>
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* Failure to achieve a grade of at least 70% on this paper will result in failure of the course, regardless of other grades. This is a policy
beyond my control.

Attendance Policy: Please attend. Exams and assignments will primarily cover material presented in class
rather than in the book.

Email Policy: Class-related email should be sent to nystrom@uta.edu. The subject line must include
“3302” or the email will be lost. The subject must contain the appropriate identifier if it is an assignment
turn-in. Emails sent to the wrong address or without proper classification in the subject may be deleted
before being read.

Do not send me MS Word documents—I will not read them. Plain text is best. If you need to send me a
formatted document, use PDF or HTML.

I will not send grades and other private information by unencrypted email. I can send mail encrypted
with GPG if you send me your public key.

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 as long as the discussion is limited to concepts and high-level approaches to solving a problem; details should not be discussed. When handing in your assignments please give credit to anyone who helped you, whether a student, an article, a book, or a webpage. 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.