

Class meetings: MW 5:00-6:15pm in CHE 100

Instructor: Jay Ligatti (ligatti@usf.edu)

Instructor office hours: MW 2:30-3:25pm & 6:25-7pm in ENB 333

Teaching Assistants: Gabriel Laverghetta (glaverghetta@usf.edu)

Parisa Momeni (parisamomeni@usf.edu)

TA office hours: Email for online or in-person appointments

Recommended Textbook: *Compiler Construction: Principles and Practice* by K. Louden

Prereq: Graduate standing

URLs: Please check the course webpage (<http://www.cse.usf.edu/~ligatti/compilers/25>) regularly for announcements, assignments, and an up-to-date schedule. You will also use Canvas (<http://my.usf.edu/>) to upload programming assignments and see course grades.

Course description: In-depth, graduate-level study of compiler design and implementation. Lexical, syntactic, and semantic analysis. Type safety. Code generation. Run-time support. Garbage collection. Code optimizations. *Desired student-learning outcomes:* Abilities to understand, explain, analyze, design, implement, and test all the standard features of compilers.

Tentative Schedule—test dates are unlikely to change; topic dates are more likely to change

<u>Week</u>	<u>Dates</u>	<u>Topics</u>	<u>Recommended Reading</u>
1	01/13, 01/15	Introduction; Compilation phases; DJ	1.1-1.7
2	01/22	Lexical analysis	2.1, 2.3
3	01/27, 01/29	Lexical analysis	2.2, 2.4, 2.6
4	02/03, 02/05	Syntactic analysis	3.1-3.4, 5.1-5.2
5	02/10, 02/12	Syntactic analysis	5.3-5.5, 4.3.1-4.3.2
6	02/17, 02/19	Syntactic analysis; Abstract syntax trees	4.1-4.2, 4.3.3
7	02/24, 02/26	Test I; Abstract syntax trees	
8	03/03, 03/05	Semantic analysis	
9	03/10, 03/12	Semantic analysis; Code generation	7.1
10	03/24, 03/26	Code generation	7.3.1, 7.4
11	03/31, 04/02	Test II*; Code generation	
12	04/07, 04/09	Code generation	
13	04/14, 04/16	Garbage collection	
14	04/21, 04/23	Code optimizations	8.9
15	04/28, 04/30	Code optimizations; Bootstrapping	
	Final Exam*, 05/05 (Monday), 3-5pm		*All tests are cumulative

Attendance: I don't take attendance in class, but absences put you at risk for missing assignments, schedule updates, and material not covered in the textbook.

Tests: There will be three tests (on 02/24, 03/31, and 05/05). Graduate students will be asked to solve additional problems, beyond what is asked of undergraduates. **There are no makeup tests or exams in this course.**

For Students with Accessibility Memoranda: Please email the instructor to arrange accommodations. **Do not schedule any tests with Student Accessibility Services.** This course has its own separate, reduced-distraction site (tentatively, room ENB 328) for taking tests. One of the Teaching Assistants will proctor tests in this separate site, at approximately the same times that the tests are being proctored in the main site (i.e., room CHE 100).

Essay Policy: Tests may include one or more essay questions. Respond in complete sentences. Avoid extraneous details in your responses. Also avoid using bulleted/enumerated lists in your responses. Essays will be graded based on readability, correctness, and thoroughness.

Assignments: There will be six programming assignments, due at 11:59pm on the following dates: 01/26, 02/09, 03/02, 03/23, 04/13, and 04/30. These assignments will build a compiler for programs written in a new language called DJ (Diminished Java). Graduate students will be asked to implement additional features, beyond what is asked of undergraduates. Do not post your assignment solutions on any medium that could be accessed by other current or future Compilers students (e.g., in a public GitHub repository), as doing so may make you an accessory to another student’s plagiarism.

Late Assignments: For each day an assignment is late—up to a maximum of 2 days—the grade is reduced 10%. For example, if you submit a 90%-correct assignment 2 days late, your overall assignment score will be 70%.

(Non-)Group Work Policy: Everything you turn in for this course—tests and assignments—must be your own, individual work. Tests are closed books, notes, neighbors, phones, AI assistants, smart glasses, smart watches, etc.

Final-Grade Breakdown:

37%	Assignments	(5% Assignment I; 3% Assignment II; 5% Assignment III; 5% Assignment IV; 9% Assignment V; 10% Assignment VI)
63%	Tests	(19% Test I; 19% Test II; 25% Test III)

100%	Total	

Grading Scale: The scale for final letter grades is as follows, using standard notation for ranges: A (∞ ,93.3] A- (93.3,90] B+ (90,86.7] B (86.7,83.3] B- (83.3,80] C+ (80,76.7] C (76.7,73.3] C- (73.3,70] D+ (70,66.7] D (66.7,63.3] D- (63.3,60] F (60,0]. An A+ may be awarded for exceptionally outstanding work.

Email: **For any questions related to the course, please first email a teaching assistant. If you have done so but are not satisfied with the response, then please email the instructor.** Allow at least 48 hours for a response.

Old Tests: To give you an idea of the sorts of questions I’ve asked in the past, previous years’ tests are posted online, linked from the course webpage. Although the TAs and I may provide hints on how to solve old test problems during our office hours, due to heavy volumes of questions, we will not respond to emailed questions about old test problems, nor will we typically provide complete solutions. Because topics and problems change each year, I recommend focusing your study time on your notes from this year’s class meetings.

Academic Honesty: Again, everything you turn in for this course must be your own, individual work. Students caught violating academic integrity will receive an FF grade for the course.

Additional USF policies (e.g., regarding academic integrity) may be accessed at: <https://www.usf.edu/provost/faculty/core-syllabus-policy-statements.aspx>