CSE 4305/5317 : Compilers
2023 Fall
2023 August 01, v1.0

Instructor Information

Instructor(s)
Brian A. Dalio

As the instructor for this course, I reserve the right to adjust this syllabus in any way that serves the educational needs of the students enrolled in this course. — Brian A. Dalio

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ERB 557

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+1-817-272-3785

Email Address
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Faculty Profile
Brian A. Dalio (https://www.uta.edu/academics/faculty/profile?username=dalioba)

Office Hours
Thursdays [R], 15.30-17.00, or by appointment.

Course Information

Section Information
CSE 4305-001 / CSE 5317-001

Time and Place of Class Meetings
Fridays [F], 16.00-18.50, NH 229. Physical presence *required*. All class meetings are In-Person. The modality is ON-CAMPUS. (https://www.uta.edu/academics/courses-and-schedules)

Description of Course Content (Catalog)
> ### CSE 4305
Review of programming language structures, translation, and storage allocation. Theory and practice of compilers and issues in compiler construction including parsing, intermediate code generation, local optimization problems such as register allocation, data-flow analysis, and global optimization.

> ### CSE 5317
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

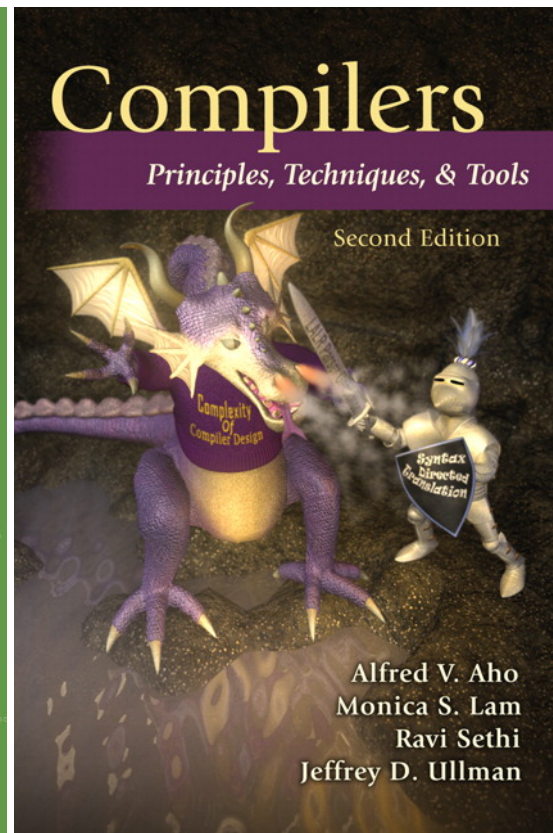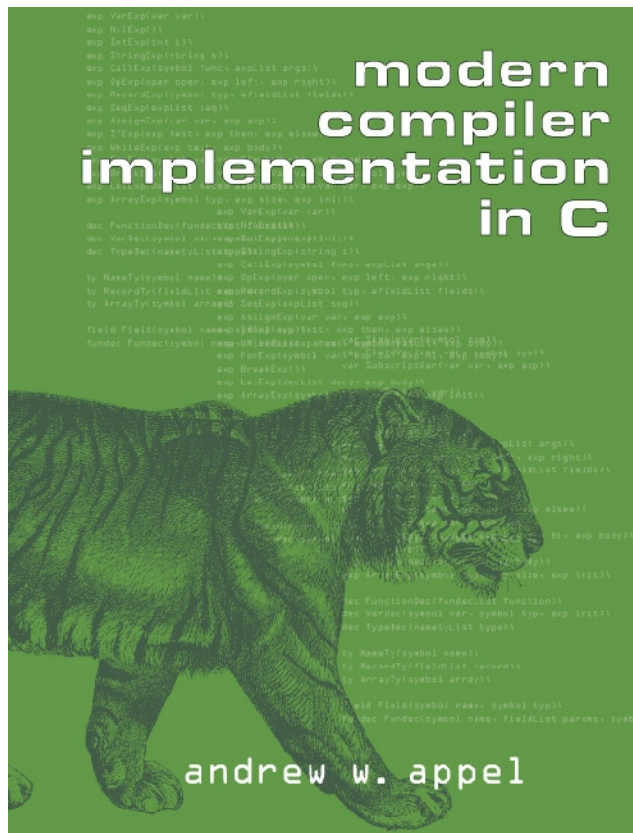After completing this course, the successful student

- will gain an in-depth understanding of many theoretical and practical aspects of modern compiler technology, including scanning, parsing, type-checking, code generation and optimization, and storage allocation.

- will have the skills to design and implement practical optimizing compilers for programming languages.

Required Textbooks and Other Course Materials
All required reading materials will be provided online.

Supplemental books
- Modern Compiler Implementation in C, Andrew Appel, (2004) Cambridge University Press, ISBN-13: 978-0521607650.
  - Website: https://www.cs.princeton.edu/~appel/modern/c/

- Compilers — Principles, Techniques, and Tools, Second Edition, Aho, Lam, Sethi, Ullman, (2007) Addison Wesley, ISBN-13: 978-0321486813.

Descriptions of major assignments and examinations

EXAMINATIONS : There will be a midterm examination and a comprehensive final examination given at the end of the semester. See *Course Schedule* below for the date / time. The exact date / time of either the midterm or the final might have to be changed. If the date / time for either the midterm or the final has to be changed, announcements will be made.

Anything we discuss in class, is presented in class or the notes, handouts, etc., is covered in the referenced portions of the text, and so forth is part of the testable content for this class. (This includes the Syllabus itself as well. :)

Examinations are closed book / closed notes. No materials of any kind are permitted. No notes, no texts, no scrap paper, no phones, no smartwatches, no calculators, no headsets, no earbuds, nothing else. Any use of any materials will be construed as a violation of the *Honor Code* and will result in a score of **ZERO** for the examination.

You must have your valid University of Texas / Arlington student ID as identification for taking any examination. No, it is not permitted to use a driver's license, passport, or any other kind of identification instead of your Student ID. Not displaying a legible and valid UTA Student ID as identification will result in a score of **ZERO** for the examination.

There will be **no** make-up examinations given unless one has an **approved** and properly **documented medical** excuse.

EXERCISES : There are no "homeworks" as such in this class. Instead there is a series of exercises that each student should complete **on their own** to further their understanding of the material.

These exercises are not graded and do not *directly* contribute to the student's grade.

If the student does not complete the exercises on their own, it is **highly unlikely** that they will perform very well on the examinations.

POP QUIZZES : Pop quizzes may be given at various times during the semester to gauge your understanding of the lecture and reading materials. **No** make-up quizzes will be given.

ACTIVE LEARNING : On occasion active learning exercises may be performed in class to help you better understand the topics being covered in the course. These exercises will typically be done in small groups. All students are expected to participate.

Technology Requirements
Canvas will be used to supply all course information, announcements, and materials (including this Syllabus). All class assignments will be submitted using Canvas. Ensure that you are able to review materials on the Canvas website for this class and especially that you can receive email from Canvas.

All lectures are delivered *in person*. The lectures are *not* recorded. Your physical presence is *required* for all class meetings.

You *must* have your valid, current University of Texas / Arlington Student ID to take the examinations.

Grading Information

Grading
This class uses the *Total Point System* for earning a grade. Each exam, quiz, active learning session, etc. is worth some number of points, with the final exam worth the most points. The complete earned grade is the number of points earned divided by the total number of points possible. This grade is converted to a letter grade according to the following scale,

>= 90%	**A**
[80%, 90%)	**B**
[70%, 80%)	**C**
[60%, 70%)	**D**
< 60%	**F**

Students are expected to keep track of their performance throughout the semester and seek guidance from available sources (including the instructor) if their performance drops below satisfactory levels; see "Student Support Services," below.

Historical Grade Distribution
Historically, students in *Compilers* have earned the following grade distribution (rounded),

A	41%
B	21%
C	19%
D	9%
F	10%

The percentages for the **A**, **B**, and **C** ranks are actually a bit better than shown because the **D** and **F** ranks include some students who stopped coming to class, yet failed to submit the proper *Course Drop* paperwork as well as some who violated the *Honor Code*.

Students are expected to keep track of their performance throughout the semester and seek guidance from available sources (including the instructor) if their performance drops below satisfactory levels; see *Academic Success Center* below.

Make-ups
There will be **no** make-ups given unless one has an ***approved*** and properly ***documented medical*** excuse.

Expectations for Out-of-Class Study
Beyond the time required to attend each class meeting, students enrolled in this course should expect to spend at least an additional 10.5 hours per week of their own time in course-related activities, including researching special topics, reading required materials, completing exercises, preparing for exams, etc.

Grade Grievances
Any appeal of a grade in this course must follow the procedures and deadlines for grade-related grievances as published in the current University Catalog.

Course Schedule

All lectures are delivered *in person*. The lectures are **not** recorded. Your physical presence is *required* for all class meetings.

Important dates
https://www.uta.edu/academics/academic-calendar/fall-2023

First day of classes	2023 August 21
Labor Day holiday	2023 September 04
Census date	2023 September 06
Midterm examination	2023 October 06 at normal class time ***subject to change***
Last day to drop	2023 October 27 submit **before** 16.00
Thanksgiving holiday	2023 November 22-24
Last day of classes	2023 December 05
Final examination	2023 December 08 17.30 — 20.00 ***subject to change***

There will be **no** make-up examinations given unless one has an ***approved*** and properly ***documented medical*** excuse.

Course Topics

Module	*Description*
M01	Introduction
M02	Lexical Analysis
M03	Parsing (Syntactic Analysis)
M04	Abstract Syntax
M05	Semantic Analysis
M06	Activation Records
M07	Intermediate Code
M08	Basic Blocks and Traces
M09	Instruction Selection
M10	Liveness Analysis
M11	Register Allocation
M12	(Advanced Topics)

Institutional Information

UTA students are encouraged to review the below institutional policies and informational sections and reach out to the specific office with any questions. To view this institutional information, please visit the [Institutional Information](#) page (https://resources.uta.edu/provost/course-related-info/institutional-policies.php) which includes the following policies among others:
- Drop Policy

- Disability Accommodations
- Title IX Policy
- Academic Integrity
- Student Feedback Survey
- Final Exam Schedule

Additional Information

Face Covering Policy
Face coverings are not mandatory; all students and instructional staff are welcome to wear face coverings while they are on campus or in the classroom.
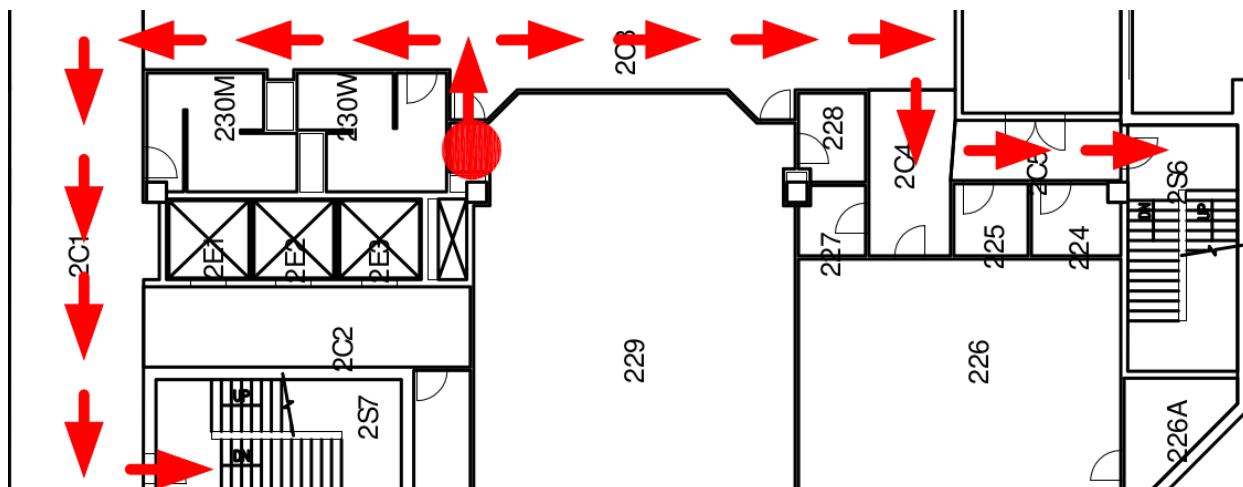
Attendance
Attending class sessions is a critical predictor and indicator of student success. The University of Texas at Arlington does not recognize a single attendance policy but encourages faculty–to establish class-specific policies on attendance. As the instructor of this section, attendance is *required.*

The U.S. Department of Education requires that UT Arlington have a mechanism in place to verify Federal Student Aid recipients' attendance in courses. UT Arlington instructors are expected to report the last date of attendance when submitting students' final course grades; specifically, when a student earns a course grade of F, instructors must report the last date a student attended their class. For on-campus classes, the last date of attendance can be based on attendance rosters or on academic engagements—a test, participation in a class project or presentation, or Canvas-based activity. Online or distance education courses require regular and substantive online interaction and participation. Students must participate in online course activities in Canvas to demonstrate attendance; logging into an online class is not sufficient by itself to demonstrate attendance. The last date of attendance is reported to the U.S. Department of Education for federal financial aid recipients.

Emergency Exit Procedures
Should we experience an emergency event that requires evacuation of the building, students should exit the room and move toward the nearest exit. (See following illustration.) When exiting the building during an emergency, do not take an elevator but use the stairwells instead. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist individuals with disabilities.

Academic Success Center

The Academic Success Center (ASC) includes a variety of resources and services to help you maximize your learning and succeed as a student at the University of Texas at Arlington. ASC services include supplemental instruction, peer-led team learning, tutoring, mentoring and TRIO SSS. Academic Success Center services are provided at no additional cost to UTA students. For additional information visit: [Academic Success Center](https://www.uta.edu/student-success/course-assistance) (https://www.uta.edu/student-success/course-assistance). To request disability accommodations for tutoring, please complete this [tutoring request form](https://www.uta.edu/student-success/course-assistance/tutoring/request) (https://www.uta.edu/student-success/course-assistance/tutoring/request).

The IDEAS Center (https://www.uta.edu/ideas/) **(**2nd Floor of Central Library) offers **FREE** tutoring and mentoring to all students with a focus on transfer students, sophomores, veterans and others undergoing a transition to UT Arlington. Students can drop in or check the schedule of available peer tutors at www.uta.edu/IDEAS, or call (817) 272-6593.

The English Writing Center (411LIBR)
The Writing Center offers **FREE** tutoring in 15-, 30-, 45-, and 60-minute face-to-face and online sessions to all UTA students on any phase of their UTA coursework. Register and make appointments online at the Writing Center (https://uta.mywconline.com). Classroom visits, workshops, and specialized services for graduate students and faculty are also available. Please see Writing Center: OWL (http://www.uta.edu/owl) for detailed information on all our programs and services.

The Library's 2nd floor Academic Plaza (http://library.uta.edu/academic-plaza) offers students a central hub of support services, including IDEAS Center, University Advising Services, Transfer UTA and various college/school advising hours. Services are available during the library's hours (https://library.uta.edu/hours) of operation.

Librarian to Contact
Each academic unit has access to Librarians by Academic Subject (http://www.uta.edu/library/help/subject-librarians.php) that can assist students with research projects, tutorials on plagiarism and citation references as well as support with databases and course reserves.

Emergency Phone Numbers

In case of an on-campus emergency, call the UT Arlington Police Department at **817-272-3003** (non-campus phone), **2-3003** (campus phone). You may also dial 911. Non-emergency number 817-272-3381

Library Information

Research or General Library Help
Ask for Help
- [Academic Plaza Consultation Services](library.uta.edu/academic-plaza) (library.uta.edu/academic-plaza)
- [Ask Us](ask.uta.edu/) (ask.uta.edu/)
- [Research Coaches](http://libguides.uta.edu/researchcoach) (http://libguides.uta.edu/researchcoach)

Resources
- [Library Tutorials](library.uta.edu/how-to) (library.uta.edu/how-to)
- [Subject and Course Research Guides](libguides.uta.edu) (libguides.uta.edu)
- [Librarians by Subject](library.uta.edu/subject-librarians) (library.uta.edu/subject-librarians)
- [A to Z List of Library Databases](libguides.uta.edu/az.php) (libguides.uta.edu/az.php)
- [Course Reserves](https://uta.summon.serialssolutions.com/#!/course_reserves) (https://uta.summon.serialssolutions.com/#!/course_reserves)

- [Study Room Reservations](openroom.uta.edu/) (openroom.uta.edu/)

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