

# CSC 448 – Introduction to Compiler Design – Syllabus

## Course Information

- CSC 448 – Introduction to Compiler Design
- Class Hours: Wed 5:45pm - 9:00pm
- Location: LEWIS 01108
- D2L Page: <https://d2l.depaul.edu/d2l/home/652735>
- Prerequisites: CSC 301, CSC 373 and CSC 347

## Contact Information

- Instructor: Dr. David Zaretsky
- Email: [david.zaretsky@depaul.edu](mailto:david.zaretsky@depaul.edu)
- Office Hours: Wed 5:00pm-5:45pm in LEWIS 01108 & By Appointment
- Discussions: Use D2L Discussions

## Overview

An overview of the design of a compiler for a general purpose programming language; tools for designing the components of the compiler; implementing the compiler; run time environments.

## Learning Outcomes / Objectives

The class objectives will focus on teaching students the various aspects of compilers. At the conclusion of this class, the student should acquire the following capabilities:

- Understanding compiler construction
- Implementation of the various aspects of compilers including
- Create and understand grammars
- Build language parsers
- Translation and code generation from one AST to another
- Develop and implement compiler optimizations
- Test and debug their programs
- Identify correctness of programs
- Assess the performance characteristics of programs

## Course Policies

- Students must attend class. Attendance will be taken.
- Students must follow/participate in the D2L course discussions in a timely fashion.
- Classroom use of a laptop or tablet must normally be restricted to class-related tasks such as note taking, checking references, testing code examples, etc.

## Communications / Email

- Please use the Discussion forum for general questions related to assignments and course material. Do not post answers in the Discussion form.
- For specific help, you may email the Professor. Please include **CSC-448** in the subject line of emails and your full name in the body.
- If you are asking for help with code, please attach the entire source code file and be as specific as you can about what the issue is (line number(s), syntax, runtime) and what you have already tried.
- To minimize email traffic, the instructor will utilize the News feature of D2L for general announcements and use email only for more urgent notices. You can use the notifications settings in D2L to notify you of changes to the course D2L site (e.g. a new News item, changes to course grades).
- In general, I usually respond within the hour, and at most within the same day. For communication on the weekend, please allow up to 24 hours to respond.

## Textbooks

The following are recommended textbooks:

- **Advanced Compiler Design**
  - By: Muchnick
  - Purchase: [Amazon](#)
- **Modern Compiler Implementation in Java**
  - By: Appel
  - Purchase: [Amazon](#)
- **Compilers: Principles, Techniques & Tools** ("Dragon Book")
  - By: Aho, Lam, Sethi, Ullman (2017)
  - Purchase: [Amazon](#)

## Lecture Plan

The following lecture plan is tentative and subject to change as the course progresses. Lecture slides will be uploaded to D2L prior to each lecture so you may take notes.

- **Class 1:** Compiler Overview & Regular Expressions
- **Class 2:** Grammars
- **Class 3:** LR Parsing & Construction
- **Class 4:** IRs & ASTs
- **Class 5:** Semantics
- **Class 6:** X86 Architecture
- **Class 7:** Code Generation
- **Class 8:** Optimizations
- **Class 9:** Control & Data Flow
- **Class 10:** Backend Translation & Optimizations

## Assessment

Grades will be determined as follows.

- 5% Participation / Attendance
- 75% Programming Assignments (5)
- 20% Final Project + Report

## Participation & Attendance

You must attend class! Participation includes both in-class interaction as well as on the course discussion platform.

## Homework / Programming Assignments

There will typically be a homework assignment every week. You will submit your solution within D2L. Late submissions, up to 24 hours, will be accepted but will incur a 10% penalty.

Submissions more than 24 hours late will not be accepted. Submission with compilation errors will typically incur a penalty of 50%; it will usually be better to submit something partially correct that runs, as opposed to something that does not compile. Grading rubrics will typically be attached to all programming assignments; you are encouraged to review these rubrics to help you understand how your work will be graded.

The purpose of the homework assignments is to practice programming skills and to gain understanding of the underlying data structures and associated algorithms. It is okay to seek help from others - the goal being to help you better understand how to solve the problem. However, it is not acceptable to submit work that is largely a copy/variation of someone else's work. Likewise, working together with someone on the entire assignment is not acceptable. The skills & concepts practiced in homework assignments will be tested on the in-class exams and you are responsible for understanding any work that you submit for credit.

## Academic Integrity and Plagiarism

This course will be subject to the university's [Academic Integrity Policy](#). If you have any questions be sure to consult with your professor.

## Changes to Syllabus

This syllabus is subject to change as necessary during the quarter. If a change occurs, it will be thoroughly addressed during class, posted under Announcements in D2L and sent via email.

## Academic Policies

All students are required to manage their class schedules each term in accordance with the deadlines for enrolling and withdrawing as indicated in the [University Academic Calendar](#). Information on enrollment, withdrawal, grading, and incompletes can be found under [CDM Academic Policies](#).

## Online Course Evaluations

Evaluations are a way for students to provide valuable feedback regarding their instructor and the course. Detailed feedback will enable the instructor to continuously tailor teaching methods and course content to meet the learning goals of the course and the academic needs of the students. They are a requirement of the course and are key to continue to provide you with the highest quality of teaching. The evaluations are anonymous; the instructor and administration do not track who entered what responses. A program is used to check if the student completed the evaluations, but the evaluation is completely separate from the student's identity. Since 100% participation is our goal, students are sent periodic reminders over three weeks. Students do not receive reminders once they complete the evaluation. Please see the [Online Teaching Evaluations](#) for additional information.

## Incomplete Grades

An incomplete grade is a special, temporary grade that may be assigned by an instructor when unforeseeable circumstances prevent a student from completing course requirements by the end of the term and when otherwise the student had a record of satisfactory progress in the course. For additional information, please see [DePaul CDM Grading Policies](#).

## Absence Notifications

In order to petition for an excused absence, students who miss class due to illness or significant personal circumstances should complete the [Absence Notification](#) form through the Dean of Students office. Students must submit supporting documentation alongside the form. The absence notification does not mean the student is excused from course material, assignments or exams. It is ultimately up to each professor to decide what, if any, accommodation can be provided in light of this absence. It is the student's responsibility to follow up with the faculty member to inquire about such accommodations.

## Students with Disabilities

Students who feel they may need an accommodation based on the impact of a disability should contact the instructor privately to discuss their specific needs. All discussions will remain confidential. To ensure that you receive the most appropriate accommodation based on your needs, contact the instructor as early as possible in the quarter (preferably by the first week of class), and make sure that you have contacted the [Center for Students with Disabilities](#) (CSD) at:

- Email: [csd@depaul.edu](mailto:csd@depaul.edu)
- Loop Campus — Lewis Center #1420, 25 E Jackson Blvd. 312-362-8002
- Lincoln Park Campus — Student Center #370, 2250 N Sheffield Ave. 773-325-1677
- Fax: 312-362-6544; TTY: 773-325-7296

## Withdrawal

Students who must withdraw from this course may do so by using the University's web registration system and [drop dates](#). For more information on the withdraw policies and procedures, visit the [DePaul Registration](#) website.

## Retroactive Withdrawal

CDM understands certain extenuating circumstances can hinder one's ability for academic success and completion of course work. Please see the [DePaul CDM Enrollment Policies](#) for additional information on its policies regarding extenuating circumstances or missing the withdrawal deadline.