

CSC300: Syllabus

Contact Information

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Class Page: <https://reed.cs.depaul.edu/efredericks/ds1>

Class Hours: Mon 5:45pm-9:00pm

- **NOTE: There is another person at DePaul with my name. Be sure you are emailing the correct person if you email me!**
- **Office hours** are on [Zoom](#) on **Wednesdays**, from **7:15pm - 8:45pm**. I will be available in **person** in Daley 200B (14 E. Jackson Blvd), or virtually, on [Zoom](#).
- If you would like to visit me for office hours, try to join me in-person if you can. It's easier for me to draw diagrams and help you visualize concepts in person. However, Zoom is an option if you need it.
- If you would like to talk outside of office hours, please send me a message on Discord or email me -- I don't check voicemail often.
- You can expect that I will respond to email and Discord messages within 24 hours on business days.
- You can expect grades to be posted within a week of the due date.
- 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.

Course Homepage for Lectures

Course Homepage: <https://reed.cs.depaul.edu/efredericks/ds1>

- Course content, homework files, and most of the information you need is available on this site.
- Lecture slides may not be available before the class.
- Lecture slides may change after class.

Course D2L Page: [D2L](#)

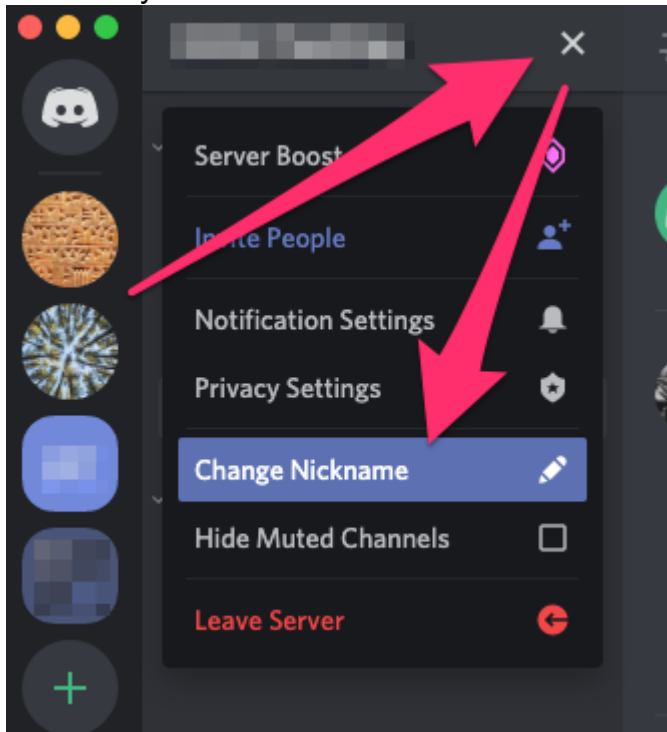
- Use D2L for homework submission, registering for exam proctoring, and for other information.

Discussion Group

We will use Discord as a discussion forum for class. It is my intention to create a learning community on Discord, so you should feel free to ask questions and engage with classmates on the material there.

- [Download](#) the native Discord app for your computer and/or mobile device.
- Click here to join the Discord server for the class: [Discord Discussion Forum](#)

- Change your nickname to be your first and last name. Use whatever firstname you prefer, but be sure that your last name is the same as it is in DePaul's Campus Connect.



- If you have a common last name, be sure to provide some indication of who you are so we can identify you.
- We have all types of students in class. Be sure to use appropriate language.
- Don't [troll](#).

Overview

This is the first course in a two-course sequence on data structures using Java. The course introduces basic Java programming, reviews recursion, introduces asymptotic notations, and focuses mainly on linear data structures including arrays, linked lists and their variants, stacks and queues, and data structures supporting disjoint-set operations. The implementation of the basic operations on each data structure are discussed and analyzed in terms of their efficiency. The applications covered highlight and exploit the unique characteristics of the data structures, and emphasize problem solving and recursive thinking.

Objectives

Programs are not just for computers: We use them to communicate to other people.

- Ability to code without typing (on paper/whiteboard)
- Understanding correctness of programming
- Understanding performance characteristics of programs
- Competence with iterative and recursive solutions to problems
- Basic object-oriented programming
- Use of debuggers
- Use of testing

Plus

- Understanding of linked lists and “resizable arrays”
- Understanding of stacks, queues, dequeues

- Understanding of heaps
- Understanding of union-find

A **data structure** is a concrete implementation of an abstract type.

- For example, linked lists and resizable arrays are data structures that could be used to represent the “list” type in python
- Which does python use? Why?

Lecture Plan

The following lecture plan is tentative and subject to change as the course progresses.

- **Class 1:** [2023/03/27] Arrays and Loops (1.1)
- **Class 2:** [2023/04/03] Loop Review, Java Memory, Testing and Debugging (1.1)
- **Class 3:** [2023/04/10] Linked Structures (1.2, 1.3)
- **Class 4:** [2023/04/17] Exam 1, Recursion, Java Memory and Scope, More Stacks (1.1, 1.3)
- **Class 5:** [2023/04/24] Counting and Intro to Analysis (1.3, 1.4)
- **Class 6:** [2023/05/01] Nested Loops, Analysis of Algorithms (1.4)
- **Class 7:** [2023/05/08] Exam 2, More Analysis, Union Find (1.4, 1.5)
- **Class 8:** [2023/05/15] Elementary Comparison-Based Sorting (1.2, 2.1, 2.5)
- **Class 9:** [2023/05/22] Priority Queues and Heaps (2.4, 6.1)
- **Class 10:** [2023/05/29] Review
- **Class 11:** [2023/06/05] Final exam

Lecture slides will be available after each lecture. They *may* be available before the lecture, but may change.

Prerequisites

A prior programming class.

Textbooks

If you are delayed in getting the texts, you can view them online at [O'Reilly](https://www.oreilly.com/catalog/errata/csp/index.html).

Required Books

[Core Java SE 9 for the Impatient, 2nd Edition](#) [[Amazon](#), [Indiebound](#)]
by Cay Horstmann (Addison-Wesley, 2017)
Available as [Ebook](#)
([Online version](#))
[Companion site](#).
Older edition is fine.

[Algorithms 4e](#) [[Amazon](#), [Indiebound](#)]
by Robert Sedgewick and Kevin Wayne (Addison-Wesley, 2011)
Available as [Ebook](#)
([Online version](#))
([Author videos](#)) These are also for sale as an [Ebook](#)
[Companion site](#).
Do not get an older edition. They are completely different books.

Recommended Books

[Schaum's Outline of Data Structures with Java 2e](#) [[Amazon](#), [Indiebound](#)]

by John Hubbard (Schuams, 2009)

This book is a good source of example problems with solutions.

More Books

[How to Think Like a Computer Scientist](#)

by Allen B. Downey.

Free!

An good introduction to Java.

Skip the GridWorld chapters, which are intended to help with the AP exam in CS.

See also these [lecture notes from MIT](#). The first three lectures are particularly useful.

[Java for Python Programmers](#)

by Brad Miller.

Free!

[Introduction to Programming in Java \(Chapter 1\)](#)

by Robert Sedgewick and Kevin Wayne

Free!

This is the first chapter of the introductory text written by the authors of our primary textbook.

It presents the same material as section 1.1 of the primary text, but at a slower pace.

[Effective Java 3e](#) [[Amazon](#), [Indiebound](#)]

by Joshua Bloch (Addison-Wesley, 2008)

Available as [Ebook](#)

([Online version](#))

The algorithms text describes all of the Java that is required for the class. The discussion is terse, making it an excellent reference. If you would like a longer discussion of Java, you might want a supplementary text. In this case, you might consider one of the following.

- Kathy Sierra and Bert Bates's "Head First Java" ([Online version](#))
- Bruce Eckel's [Thinking in Java, 4th Edition](#)
- David Flanagan's "Java in a Nutshell" ([Online version](#))
- Cay Horstman's "Big Java" ([Online version](#))

Expectations

We will discuss concepts in class.

You will have weekly programming assignments.

- You do not have to do it alone, but you must be self-motivated.
- You can ask me and other members of the class.
- You must start assignments early.

Getting the homework correct is not enough. **Simply getting programming homework to work once will not help you communicate to me that you understand the concepts you need to learn.** You need to learn how to draw pictures diagramming concepts we are covering, and to write code on paper, without a compiler, notes, Google, etc.

Attendance

If you are in Section 901, DePaul University, and I, expect you to attend class!

- Incomplete Grades

An incomplete grade is defined in the Student Handbook as follows (note that the policy in the undergraduate student handbook applies to both undergraduate and graduate students): A temporary grade indicating that the student has a satisfactory record in work completed, but for unusual or unforeseeable circumstances not encountered by other students in the class and acceptable to the instructor is prevented from completing the course requirements by the end of the term. Please see <https://www.cdm.depaul.edu/Current%20Students/Pages/Grading-Policies.aspx> for additional information.

- Retro-Active Withdrawal

CDM understands certain extenuating circumstances can hinder one's ability for academic success and completion of course work. Please see <https://www.cdm.depaul.edu/Current%20Students/Pages/Enrollment-Policies.aspx> for additional information.

- 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 process through the Dean of Students office. The form can be accessed at <https://offices.depaul.edu/student-affairs/support-services/academic/Pages/default.aspx>. Students must submit supporting documentation alongside the form. The professor reserves the sole right whether to offer an excused absence and/or academic accommodations for an excused absence.

Assessment

Grades will be determined as follows.

- 20% Quizzes
- 25% Programming assignments
- 55% Exams
 - Exam 1: 15%
 - Exam 2: 15% (Cumulative)
 - Final Exam: 25% (Cumulative)

Programming assignments that do not compile will receive zero points, and will not be eligible for resubmission.

Resubmission of Programming Assignments: Our goal is to help you learn how to be good programmers. In order to help you learn, you will receive feedback on the code you submit. Feedback will give you important information about correctness, code quality, and readability. **If you submitted your programming assignment on time, you will get feedback within one week, and you will have one additional week to submit your code for up to 90% partial credit.**

Late homework: Late homework can be submitted for 50% of the credit you would have received if you had submitted it on time. Late homework is not eligible for resubmission.

I will drop one quiz and one homework from your final grade.

Exams will be given on paper, in person. **There are no online exams.** You must appear physically in front of a proctor (either the instructor or someone else, as described in the policy linked below.)

- Students in the in-person section must be vaccinated and must take the exam on the chosen day and time, as announced on the course schedule.
- Students in online sections (synchronous or asynchronous) must register with a proctor for both exams. In order to register, use the *CDM Proctored Exams* section of the course homepage on [D2L](#). You must register at least a week before the exam. Please do it ASAP. For further information, see [here](#)

[DePaul's academic integrity policy.](#)

All students are expected to abide by the University's Academic Integrity Policy which prohibits cheating and other misconduct in student coursework. Publicly sharing or posting online any prior or current materials from this course (including exam questions or answers), is considered to be providing unauthorized assistance prohibited by the policy. Both students who share/post and students who access or use such materials are considered to be cheating under the Policy and will be subject to sanctions for violations of Academic Integrity.

On exams, you must work alone, **without any external resources.**

It is your responsibility to ensure that you can complete any given homework or quiz question in about five minute, working alone, without using external sources.

To solve the weekly homeworks and quizzes, you may find it useful to consult external resources at first. That's fine. However, it is then incumbent on you to repeat those problems until you can do them yourself, starting from scratch, in a reasonable amount of time (about five minutes).
