New York University Tandon School of Engineering
Computer Science and Engineering Department

CS-UY 1134: Data Structures and Algorithms
Fall 2018

Section A	Mon, Wed 3:00pm to 4:20pm
Section B	Mon, Wed 10:30am to 11:50am
Section C	Mon, Wed 4:30pm to 5:50pm

Contact Information
Professor Tal: itay.tal@nyu.edu, 2 MetroTech Center, Room 10.056

Office Hours
Will be posted by your instructor

Course Prerequisites
- CS-UY 1114 (C- or better)
- Not open to students who have taken CS-UY 2134.

Course Description
This course covers abstract data types and the implementation and use of standard data structures along with fundamental algorithms and the basics of algorithm analysis.

Course Objectives
At the completion of this course a student will:
1. Be familiar with basic techniques of algorithm analysis
2. Be able to design and analyze recursive algorithms
3. Be familiar with fundamental data structures, their implementation and performance: dynamic arrays, stacks and queues
4. Master the implementation of linked data structures such as linked lists and binary trees
5. Be familiar with advanced data structures such as search trees, hash tables, priority queues and graphs
6. Have a practical understanding of the concepts of data abstraction.
7. Be familiar with several searching and sorting algorithms including insertion-sort, merge-sort and heap-sort

Course Structure
Most of the material will be presented in lectures. Reading assignments from the textbook, programming and other exercises in the lab, and weekly homework assignments will reinforce this material. You should expect to spend a substantial time outside the class working on the homework assignments.

Assignments and other important announcements will be posted on NYU Classes. You should check the course page every day and sign up for e-mail notification of announcements.

Readings
The textbook for the course is:
Data Structures and Algorithms in Python ,1st Edition, Michael T. Goodrich, Roberto Tamassia, Michael H. Goldwasser. ISBN-13: 978-1118290279. ISBN-10: 1118290275.

There is also an electronic version of the textbook, which is less expensive. Copies are available in the NYU bookstore, as well as other book vendors. Several copies are on reserve in the Dibner Library.

Course requirements
Tests: There will be two midterm exams and a final exam. These exams will include some short answer and/or multiple choice questions, as well as programming problems.

Homework assignments: Will reinforce the material covered in the lectures and in the textbook. Although these count for a relatively small percentage of your grade, it is essential that you do them and understand the solutions. *It is unlikely that you will do well on the exams if you do not understand how to solve problems like the homework exercises.*

Labs: You are expected to come on time to all labs, complete the required work, and help others if you finish early. Your lab grade will mostly reflect the effort you made to solve the problems during the lab time.

Grading
Grades will be computed roughly as follows:
> 20% First midterm exam + 20% Second midterm exam + 30% Final exam
> + 20% Homework + 10% Lab grade

We may tweak the formula a little, for example, by slightly changing the weights.

Course Topics
- Python review and additional topics (Chapters 1-2)
- Asymptotic analysis (Chapter 3)
- Recursion (Chapter 4)
- Dynamic Arrays and Amortization (Chapter 5)
- Stacks and Queues (Chapter 6)
- Linked lists (Chapter 7)
- Binary Trees (Chapter 8)
- Search trees (Chapter 11)
- Hash tables (Chapter 10)
- Priority queues (Chapter 9)
- Sorting and selection (Chapter 12)
- Graph algorithms (Chapter 14)

Important Dates
Tue 9/4: Fall 2017 Classes Begin
Mon 10/8: Fall Recess, No Class
Tue 10/9: Legislative Day - Classes will meet according to a Monday schedule
Tue 10/23: Midterm 1
Mon 11/5: Last day to withdraw with a "W"
Tue 11/20: Midterm 2
11/21 – 11/23: Thanksgiving Recess, No Class
Fri 12/14: Last Day of Fall 2017 Classes
12/17 – 12/21: Fall Semester Exams. **The final exam could be any time during this week. Do not buy plane tickets or make any other travel arrangements that involve leaving before 12/21!!!**

Policy on Academic Dishonesty
Please review the NYU School of Engineering Policy on Academic Dishonesty
http://engineering.nyu.edu/academics/code-of-conduct/academic-dishonesty

In this class, some of the labs will be done with a partner. For homework assignments, you may discuss the general idea of how to approach a program with other students. You may get help debugging a program from another student, though it would be better to get help from a TA. You may **NOT** show completed or substantially completed code to other students, copy code written by others, or get others to write code for you. Violations of this policy will result in a grade of ZERO on the work in question and may result in further disciplinary action.

Moses Center Statement of Disability
If you are student with a disability who is requesting accommodations, please contact New York University's Moses Center for Students with Disabilities at 212-998-4980 or mosescsd@nyu.edu. You must be registered with CSD to receive accommodations. Information about the Moses Center can be found at www.nyu.edu/csd. The Moses Center is located at 726 Broadway on the 2nd floor.