**CSCI 235 Analysis and Design 2 Hunter College**

**LECTURE**   Tong Yi   ty680@hunter.cuny.edu  
M T W Th 9:50 – 11:24 AM on BlackBoard Collaborate

**TEXTBOOK**   [**Data Abstraction and Problem Solving with C++: Walls and Mirrors**](https://www.vitalsource.com/products/data-abstraction-amp-problem-solving-with-c-walls-frank-m-carrano-timothy-m-v9780134477473?term=C%2B%2B+walls+mirrors), 7th Edition **[eText](https://www.vitalsource.com/products/data-abstraction-amp-problem-solving-with-c-walls-frank-m-carrano-timothy-m-v9780134477473?term=C%2B%2B+walls+mirrors" \t "_blank)**, Frank M. Carrano, ISBN-13 978-0134463971. Must be rented ($39) or purchased ($59) from [**Vitalsource.com**](https://www.vitalsource.com/products/data-abstraction-amp-problem-solving-with-c-walls-frank-m-carrano-timothy-m-v9780134477473?term=C%2B%2B+walls+mirrors) in order for the chapter links to work!

**COURSE OUTLINE**

| **DATE** | **TOPIC** | **READING** | **SLIDES** | **ASSIGNMENTS** |
| --- | --- | --- | --- | --- |
| 5/27 | Introduction  Data Abstraction OOP | [Programming Guidelines](https://maryash.github.io/235/programming_guidelines.html)  [Chapter 1](https://bookshelf.vitalsource.com/#/books/9780134477473/epubcfi/6/30%5B%3Bvnd.vst.idref%3DP70010119250000000000000000005D9%5D!/4/2%5BP70010119250000000000000000005D9%5D/2/2%5BP7001011925000000000000000009091%5D/4%400:0) [Appendix B](https://bookshelf.vitalsource.com/#/books/9780134477473/epubcfi/6/450%5B%3Bvnd.vst.idref%3DP7001011925000000000000000006BC2%5D!/4/2%5BP7001011925000000000000000006BC2%5D/2/2%5BP700101192500000000000000000E4E6%5D/4%400:0) | [Introduction](https://maryash.github.io/235/slides/01_introduction.pdf)  [Abstraction](https://maryash.github.io/235/slides/02_oop.pdf) |  |
| 6/1 | Inheritance | [C++ Interlude 1](https://bookshelf.vitalsource.com/#/books/9780134477473/epubcfi/6/48%5B%3Bvnd.vst.idref%3DP700101192500000000000000000099F%5D!/4/6%400:0) | [Inheritance](https://maryash.github.io/235/slides/03_inheritance.pdf) | SQ Basic Inheritance, Project 1 |
| 6/2 | ADTs, Templates | [Chapter 3.1](https://bookshelf.vitalsource.com/#/books/9780134477473/epubcfi/6/86%5B%3Bvnd.vst.idref%3DP7001011925000000000000000001247%5D!/4/6%400:0) | [ADTs & Templates](https://maryash.github.io/235/slides/04_adt_templates.pdf) |  |
| 6/3 | Array Implementation | [Chapter 3.2](https://bookshelf.vitalsource.com/#/books/9780134477473/epubcfi/6/88%5B%3Bvnd.vst.idref%3DP700101192500000000000000000128D%5D!/4/2%5BP700101192500000000000000000128D%5D/2/2%5BP7001011925000000000000000009B14%5D/2%400:0) | [Array Bag](https://maryash.github.io/235/slides/05_array_bag.pdf) | [SQ ArrayBag](https://maryash.github.io/235/study_questions/sq_02_ArrayBag.pdf) |
| 6/7 | Pointers | [C++ Interlude 2.1, 2.2, 2.3, 2.5](https://bookshelf.vitalsource.com/#/books/9780134477473/epubcfi/6/98%5B%3Bvnd.vst.idref%3DP700101192500000000000000000151A%5D!/4/2%5BP700101192500000000000000000151A%5D/2/2%5BP7001011925000000000000000009D22%5D/4%400:0) [Pointers, etc Tutorial](https://www.ntu.edu.sg/home/ehchua/programming/cpp/cp4_pointerreference.html) | [Pointers](https://maryash.github.io/235/slides/06_Pointers.pdf) |  |
| 6/8 | Link-Based Implementation | [Chapter 4](https://bookshelf.vitalsource.com/#/books/9780134477473/epubcfi/6/110%5B%3Bvnd.vst.idref%3DP7001011925000000000000000001798%5D!/4/2%5BP7001011925000000000000000001798%5D/2/2%5BP7001011925000000000000000009F33%5D/4%400:0) | [LinkedBag](https://maryash.github.io/235/slides/07_LinkedBag.pdf) | [SQ LinkedBag](https://maryash.github.io/235/study_questions/sq_03_LinkedChain.pdf) |
| 6/9 | Copy Constructor |  | [Copy Constructor](https://maryash.github.io/235/slides/08_Copy_Constructor.pdf) |  |
| 6/10 | Lists | [Chapter 8](https://bookshelf.vitalsource.com/#/books/9780134477473/epubcfi/6/188%5B%3Bvnd.vst.idref%3DP7001011925000000000000000002728%5D!/4/2%5BP7001011925000000000000000002728%5D/2/2%5BP700101192500000000000000000AC19%5D/4%400:0) [Chapter 9](https://bookshelf.vitalsource.com/#/books/9780134477473/epubcfi/6/202%5B%3Bvnd.vst.idref%3DP700101192500000000000000000295E%5D!/4/2%5BP700101192500000000000000000295E%5D/2/2%5BP700101192500000000000000000AE08%5D/4%400:0) | [Lists](https://maryash.github.io/235/slides/09_lists.pdf) | [SQ Lists](https://maryash.github.io/235/study_questions/sq_04_lists.pdf) |
| 6/14 | Exception Handling | [C++ Interlude 3](https://bookshelf.vitalsource.com/#/books/9780134477473/epubcfi/6/162%5B%3Bvnd.vst.idref%3DP7001011925000000000000000002395%5D!/4/2%5BP7001011925000000000000000002395%5D/2/2%5BP700101192500000000000000000A90C%5D/4%400:0) | [Exception Handling](https://maryash.github.io/235/slides/10_exception_handling.pdf) |  |
| 6/15 | Polymorphism (not on midterm) | [C++ Interlude 2.4](https://bookshelf.vitalsource.com/#/books/9780134477473/epubcfi/6/106%5B%3Bvnd.vst.idref%3DP70010119250000000000000000016EA%5D!/4/6%400:0) | [Polymorphism](https://maryash.github.io/235/slides/11_polymorphism.pdf) | [SQ Polymorphism](https://maryash.github.io/235/study_questions/sq_05_polymorphism.pdf) |
| 6/16 | Midterm Review |  |  |  |
| 6/17 | MIDTRERM | EXAM |  |  |
| 6/21 | Polymorphism | [C++ Interlude 2.4](https://bookshelf.vitalsource.com/#/books/9780134477473/epubcfi/6/106%5B%3Bvnd.vst.idref%3DP70010119250000000000000000016EA%5D!/4/6%400:0) | [Polymorphism](https://maryash.github.io/235/slides/11_polymorphism.pdf) | [SQ Polymorphism](https://maryash.github.io/235/study_questions/sq_05_polymorphism.pdf) |
| 6/22 | Recursion | [Chapters 2](https://bookshelf.vitalsource.com/#/books/9780134477473/epubcfi/6/62%5B%3Bvnd.vst.idref%3DP7001011925000000000000000000BEE%5D!/4/2%5BP7001011925000000000000000000BEE%5D/2/2%5BP70010119250000000000000000095A9%5D/4%400:0)[& 5 &](https://bookshelf.vitalsource.com/#/books/9780134477473/epubcfi/6/128%5B%3Bvnd.vst.idref%3DP7001011925000000000000000001B70%5D!/4/2%5BP7001011925000000000000000001B70%5D/2/2%5BP700101192500000000000000000A272%5D/4%400:0)[Appendix E](https://bookshelf.vitalsource.com/#/books/9780134477473/epubcfi/6/496%5B%3Bvnd.vst.idref%3DP7001011925000000000000000007090%5D!/4/2%5BP7001011925000000000000000007090%5D/2/2%5BP700101192500000000000000000E8E1%5D/4%400:0) [Number of Permutations](https://is.gd/QWt5OJ) | [Recursion](https://maryash.github.io/235/slides/12_recursion.pdf) [Drawing App](http://recursivedrawing.com/) |  |
| 6/23 |  | Number of Combinations:[1,](https://is.gd/HC7YxX)[2](https://is.gd/tMWSJR) | [More Recursion](https://maryash.github.io/235/slides/13_more_recursion.pdf) | [SQ Recursion](https://maryash.github.io/235/study_questions/sq_06_recursion.pdf) |
| 6/24 | Algorithm Efficiency | Combinations:[1,](https://is.gd/tMWSJR)[2,](https://is.gd/O7PUS4) [Chapter 10](https://bookshelf.vitalsource.com/#/books/9780134477473/epubcfi/6/224%5B%3Bvnd.vst.idref%3DP7001011925000000000000000002F5A%5D!/4/2%5BP7001011925000000000000000002F5A%5D/2/2%5BP700101192500000000000000000B31A%5D/4%400:0) | [Extra math](https://maryash.github.io/235/files/binomial_coefficient.pdf) [Efficiency](https://maryash.github.io/235/slides/14_algorithm_efficiency.pdf) | [SQ Algorythm Efficiency](https://maryash.github.io/235/study_questions/sq_07_algorithm_efficiency.pdf) |
| 6/28 | Searching | [Chapter 2.4.2](https://bookshelf.vitalsource.com/#/books/9780134477473/epubcfi/6/70%5B%3Bvnd.vst.idref%3DP7001011925000000000000000000E02%5D!/4/2%5BP7001011925000000000000000000E02%5D/10%5BP7001011925000000000000000000E38%5D/2/2%5BP7001011925000000000000000009789%5D/2%400:0) [Chapter 10.2.5](https://bookshelf.vitalsource.com/#/books/9780134477473/epubcfi/6/228%5B%3Bvnd.vst.idref%3DP7001011925000000000000000002F9C%5D!/4/2%5BP7001011925000000000000000002F9C%5D/38%5BP70010119250000000000000000030B4%5D/2/2%5BP700101192500000000000000000B426%5D/2%400:0) | [Searching](https://maryash.github.io/235/slides/15_searching.pdf) |  |
| 6/29 | Sorting | [Chapter 11](https://bookshelf.vitalsource.com/#/books/9780134477473/epubcfi/6/236%5B%3Bvnd.vst.idref%3DP7001011925000000000000000003188%5D!/4/2%5BP7001011925000000000000000003188%5D/2/2%5BP700101192500000000000000000B4CD%5D/4%400:0) | [Sorting](https://maryash.github.io/235/slides/16_sorting.pdf) | [SQ Sorting](https://maryash.github.io/235/study_questions/sq_08_sorting.pdf) |
| 6/30 | Stacks  Stack Implementation | [Chapter 6](https://bookshelf.vitalsource.com/#/books/9780134477473/epubcfi/6/144%5B%3Bvnd.vst.idref%3DP7001011925000000000000000001F28%5D!/4/2%5BP7001011925000000000000000001F28%5D/2/2%5BP700101192500000000000000000A554%5D/4%400:0)  [Chapter 7](https://bookshelf.vitalsource.com/#/books/9780134477473/epubcfi/6/174%5B%3Bvnd.vst.idref%3DP70010119250000000000000000025C8%5D!/4/2%5BP70010119250000000000000000025C8%5D/2/2%5BP700101192500000000000000000AAEC%5D/4%400:0) | [Stacks](https://maryash.github.io/235/slides/17_stacks.pdf)  [Stack Implementation](https://maryash.github.io/235/slides/18_stack_implementation.pdf) | [SQ Stacks](https://maryash.github.io/235/study_questions/sq_09_stacks.pdf) |
| 7/1 | Queues | [Chapter 13](https://bookshelf.vitalsource.com/#/books/9780134477473/epubcfi/6/274%5B%3Bvnd.vst.idref%3DP7001011925000000000000000003B21%5D!/4/2%5BP7001011925000000000000000003B21%5D/2/2%5BP700101192500000000000000000BCB7%5D/4%400:0) | [Queues](https://maryash.github.io/235/slides/19_queues.pdf) |  |
| 7/6 | Queue Implementation | [Chapter 14](https://bookshelf.vitalsource.com/#/books/9780134477473/epubcfi/6/292%5B%3Bvnd.vst.idref%3DP7001011925000000000000000003F1B%5D!/4/2%5BP7001011925000000000000000003F1B%5D/2/2%5BP700101192500000000000000000C023%5D/4%400:0) | [Queue Implementation](https://maryash.github.io/235/slides/20_queue_implementation.pdf) | [SQ Queues](https://maryash.github.io/235/study_questions/sq_10_queues.pdf) |
| 7/7 | Trees  Smart Pointers | [Chapter 15](https://bookshelf.vitalsource.com/#/books/9780134477473/epubcfi/6/310%5B%3Bvnd.vst.idref%3DP70010119250000000000000000042F9%5D!/4/2%5BP70010119250000000000000000042F9%5D/2/2%5BP700101192500000000000000000C34F%5D/4%400:0)  [C++ Interlude 4](https://bookshelf.vitalsource.com/#/books/9780134477473/epubcfi/6/216%5B%3Bvnd.vst.idref%3DP7001011925000000000000000002CE7%5D!/4/2%5BP7001011925000000000000000002CE7%5D/2/2%5BP700101192500000000000000000B108%5D/4%400:0) | [Trees](https://maryash.github.io/235/slides/21_trees.pdf)  [Smart Pointers](https://maryash.github.io/235/slides/i4_smart_pointers.pdf) | [SQ Trees](https://maryash.github.io/235/study_questions/sq_11_trees.pdf) |
| 7/8 | Tree Implementation | [Chapter 16](https://bookshelf.vitalsource.com/#/books/9780134477473/epubcfi/6/324%5B%3Bvnd.vst.idref%3DP70010119250000000000000000047EF%5D!/4/2%5BP70010119250000000000000000047EF%5D/2/2%5BP700101192500000000000000000C782%5D/4%400:0) | [Tree Implementation](https://maryash.github.io/235/slides/22_tree_implementation.pdf) |  |
| **7/12** |  | **9:50 – 11:30 AM** | **FINAL EXAM** |  |