

## CS106B Syllabus

---

This handout contains the tentative syllabus for CS106B. Depending on how quickly we're able to make it through the material, we may end up spending more or less time on each of these topics. Readings should be done *before* the lecture for which they are assigned.

Date	Topics	Readings	Assignments
M January 9	<i>What's next in programming?</i> Course Overview The C++ Programming Language	Chapter 1	Assignment 0 Out
W January 11	<i>How can we define functions in terms of themselves?</i> Functions in C++ Recursive Functions	Chapter 2 Chapter 7.1 – 7.2	
F January 13	<i>How can we process text recursively?</i> Strings Recursion over Strings	Chapter 3 Chapter 4 Chapter 7.3 – 7.4	Assignment 0 Due Assignment 1 Out
M January 16	<b><i>Dr. Martin Luther King, Jr. Day</i></b> <b><i>No Class</i></b>		
T January 17			
W January 18	<i>How can we manipulate linear sequences?</i> Vector	Chapter 5.1	
F January 20	<i>How do we work with associative data?</i> Map, Set, and Lexicon	Chapter 5.4 – 5.6	
M January 23	<i>How does math pertain to computer security?</i> Stack and Queue Password Safety	Chapter 5.2 – 5.3	Assignment 1 Due Assignment 2 Out
W January 25	<i>How can recursion aid in problem solving?</i> Thinking Recursively	Chapter 7 Chapter 8.1	
F January 27	<i>What is a fractal?</i> Graphical Recursion Recursive Enumeration I	Chapter 8.2 Chapter 8.4	
M January 30	<i>How can we find all solutions to a problem?</i> Recursive Enumeration II	Chapter 8.3	Assignment 2 Due Assignment 3 Out
W February 1	<i>How do we find a needle in a haystack?</i> Backtracking Search I	Chapter 9	

F February 3	<i>How do we find that needle quickly?</i> Backtracking Search II		
M February 6	<i>Why are some algorithms faster than others?</i> Algorithmic Efficiency Big-O Notation	Chapter 10.1 – 10.3 Chapter 10.4 – 10.5	Assignment 3 Due Assignment 4 Out
W February 8	<i>How does CS theory influence programming practice?</i> Sorting Algorithms		
F February 10	<i>How do we define our own collection classes?</i> Designing Abstractions Classes in C++	Chapter 6	
M February 13	<i>Where does storage space come from?</i> Dynamic Allocation Implementing Stack	Chapter 11.1 – 11.3	
W February 15	<i>How does data representation impact efficiency?</i> Speeding up our Stack Implementing Queue		Assignment 4 Due
F February 17	<i>Is there just one way to store a sequence in memory?</i> Linked Lists I	Chapter 12.1 – 12.2	
M February 20	<b>Presidents' Day</b> <b>No Class</b>		
T February 21	<b>CS106B Midterm Exam</b> <b>7PM – 10PM, Location TBA</b>		
W February 22	<i>Is there just one way to implement a container?</i> Linked Lists II Implementing Stack with Linked Lists	Chapter 12.3 – 12.9	Assignment 5 Out
F February 24	<i>How can we efficiently store data in sorted order?</i> Binary Search Trees Implementing Set	Chapter 16 Chapter 17	
M February 27	<i>How can we efficiently store collections of strings?</i> Tries Implementing Lexicon		
W March 1	<i>How can we rapidly store and look up values?</i> Hash Tables Implementing HashMap	Chapter 15	
F March 3	<i>How can we store a large file inside a smaller one?</i> Huffman Encoding Greedy Algorithms		Assignment 5 Due Assignment 6 Out
M March 6	<i>How do we explore network structures?</i> Graphs Graph Searches	Chapter 18.1 – 18.4	
W March 8	<i>How can we minimize trip times?</i> Dijkstra's Algorithm A* Search	Chapter 18.6 – 18.7	

F March 10	<i>How can we wire a country efficiently?</i> Kruskal's Algorithm Maze Generation		Assignment 6 Due Assignment 7 Out
M March 13	<i>Fun and exciting extra topics!</i>		
W March 15	<i>Fun and exciting extra topics!</i>		
F March 17	<i>What comes after CS106?</i> Where to Go from Here		Assignment 7 Due No Late Submissions
M March 20	<b><i>Final Exam</i></b> <b><i>8:30AM – 11:30AM, Location TBA</i></b>		