

## CS106B Calendar

Below is the tentative syllabus for this quarter's offering of CS106B. The specific content ordering may change based on how quickly we're able to move through the relevant topics. The assigned readings may be done before or after each lecture, though we recommend doing the readings before class.

Date	Topics	Readings	Assignments
<b><i>Part One: Welcome to C++!</i></b>			
Monday, January 6	<i>Why continue onward in programming?</i> Course Overview The C++ Programming Language	Chapter 1	Assignment 0 Out
Wednesday, January 8	<i>How do we harness self-similarity?</i> Functions in C++ Recursive Functions	Chapter 2 Chapter 7	
Friday, January 10	<i>How can we process text recursively?</i> Strings and Streams Recursion over Strings	Chapter 3 Chapter 4.1 – 4.3	Assignment 0 Due Assignment 1 Out
<b><i>Part Two: Fundamental Data Types</i></b>			
Monday, January 13	<i>How do we store aggregate data?</i> Vector and Grid Branching Recursion	Chapter 5.1	
Wednesday, January 15	<i>How do we model and explore sequences?</i> Stack and Queue	Chapter 5.2 – 5.3	
Friday, January 17	<i>How do we work with associative data?</i> HashMap, HashSet, and Lexicon	Chapter 5.4 – 5.5	Assignment 1 Due Assignment 2 Out
Monday, January 20	Dr. Martin Luther King, Jr. Day National Holiday No Class		
<b><i>Part Three: Recursive Problem-Solving</i></b>			
Wednesday, January 22	<i>How do we model self-similar structures?</i> Graphical Recursion Recursive Problem-Solving	Chapter 8.1 Chapter 8.4	
Friday, January 24	<i>How do we find all solutions to a problem?</i> Enumerating Subsets	Chapter 8.2 – 8.3	Assignment 2 Due Assignment 3 Out
Monday, January 27	<i>How do we choose the best team for the job?</i> Enumerating Permutations Enumerating Combinations		
Wednesday, January 29	<i>How can we optimally allocate resources?</i> Recursive Backtracking I	Chapter 9.1 – 9.2	
Friday, January 31	<i>How do we find a needle in a haystack?</i> Recursive Backtracking II		Assignment 3 Due Assignment 4 Out

<b>Date</b>	<b>Topics</b>	<b>Readings</b>	<b>Assignments</b>
<b>Part Four: Algorithmic Efficiency</b>			
Monday, February 3	<i>Why are some algorithms faster than others?</i> Algorithmic Efficiency Big-O Notation	Chapter 10.1 – 10.2	
Wednesday, February 5	<i>How do we arrange elements into sorted order?</i> Searching and Sorting, Part I	Chapter 10.3 – 10.5	
Friday, February 7	<i>How does efficiency guide problem-solving?</i> Searching and Sorting, Part II		Assignment 4 Due Assignment 5 Out
<b>Part Five: Abstraction and Dynamic Arrays</b>			
Monday, February 10	<i>How do we define our own collection classes?</i> Designing Abstractions	Chapter 6	
Tuesday, February 11	<b>Midterm Exam</b> 7PM – 10PM, Location TBA Covers Topics from Assignment 0 – Assignment 3		
Wednesday, February 12	<i>How do single variables hold multiple values?</i> Dynamic Allocation Implementing Stack	Chapter 11 Chapter 12.1	
Friday, February 14	<i>How does data representation impact efficiency?</i> Optimizing the Stack		
Monday, February 17	Presidents' Day National Holiday No Class		
Wednesday, February 19	<i>How can we harness hard-to-predict functions?</i> Hash Functions Linear Probing, Part I	Chapter 15	
Friday, February 21	<i>What else is possible in hashing?</i> Linear Probing, Part I Hashing Strategies		Assignment 5 Due Assignment 6 Out
<b>Part Six: Linked Lists</b>			
Monday, February 24	<i>How do we form sequences from individual elements?</i> Linked Lists, Part I	Chapter 12	
Wednesday, February 26	<i>What tradeoffs exist in data representation?</i> Linked Lists, Part II	Chapter 13	
Friday, February 28	<i>How do we transfer data between groups?</i> Linked Lists, Part III		Assignment 6 Due Assignment 7 Out
<b>Part Seven: Binary Trees</b>			
Monday, March 2	<i>How can we efficiently store data in sorted order?</i> Binary Search Trees, Part I	Chapter 16.1 – 16.2	
Wednesday, March 4	<i>How can we efficiently search data in sorted order?</i> Binary Search Trees, Part II	Chapter 16.3 – 16.4	

<b>Date</b>	<b>Topics</b>	<b>Readings</b>	<b>Assignments</b>
Friday, March 6	<i>How are trees useful outside of data structures?</i> Huffman Encoding		Assignment 7 Due Assignment 8 Out
<b><i>Part Eight: Looking Forward</i></b>			
Monday, March 9	<i>How do we model and represent networks?</i> Graphs Graph Searches	Chapter 18	
Wednesday, March 11	<i>How do we make sense of complex data?</i> Clustering Algorithms Kruskal's Algorithm		
Friday, March 13	<i>What comes after CS106?</i> Where to Go from Here		Assignment 8 Due <b><i>No Late Submissions</i></b>
Monday, March 16	<b><i>Final Exam</i></b> 8:30AM – 11:30AM, Location TBA Cumulative; Covers All Topics		