

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
<i>Part One: Welcome to C++!</i>			
Monday, January 11	<i>Why continue onward in programming?</i> Course Overview The C++ Programming Language	Chapter 1	Assignment 0 Out
Wednesday, January 13	<i>How do we harness self-similarity?</i> Functions in C++ Recursive Functions	Chapter 2 Chapter 7	
Friday, January 15	<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
<i>Part Two: Fundamental Data Types</i>			
Monday, January 18	<i>Dr. Martin Luther King, Jr. Day; No Synchronous Class Meeting</i> We will provide a recorded version of our normally-scheduled lecture; watch it at your convenience sometime before Wednesday's class meeting.		
	<i>How do we store aggregate data?</i> Vector References and const References	Chapter 5.1	
Wednesday, January 20	<i>How do we model and explore sequences?</i> Stack and Queue	Chapter 5.2 – 5.3	
Friday, January 22	<i>How do we work with associative data?</i> Map, Set, and Lexicon	Chapter 5.4 – 5.5	Assignment 1 Due Assignment 2 Out
<i>Part Three: Recursive Problem-Solving</i>			
Monday, January 25	<i>How do we model self-similar structures?</i> Graphical Recursion Recursive Problem-Solving	Chapter 8.1 Chapter 8.4	
Wednesday, January 27	<i>How do we find all solutions to a problem?</i> Enumerating Subsets	Chapter 8.2 – 8.3	
Friday, January 29	<i>How do we choose the best team for the job?</i> Recursion + Iteration Enumerating Permutations		Assignment 2 Due Assignment 3 Out
Monday, February 1	<i>How can we optimally allocate resources?</i> Enumerating Combinations Recursive Backtracking, Part I	Chapter 9.1 – 9.2	
Wednesday, February 3	<i>How do we find a needle in a haystack?</i> Recursive Backtracking, Part II		

Date	Topics	Readings	Assignments
<i>Part Four: Algorithmic Efficiency</i>			
Friday, February 5	<i>Why are some algorithms faster than others?</i> Algorithmic Efficiency Big-O Notation	Chapter 10.1 – 10.2	Assignment 3 Due Assignment 4 Out
Monday, February 8	<i>How do we arrange elements into sorted order?</i> Searching and Sorting, Part I	Chapter 10.3 – 10.5	
Wednesday, February 10	<i>How does efficiency guide problem-solving?</i> Searching and Sorting, Part II		
<i>Part Five: Abstraction and Dynamic Arrays</i>			
Friday, February 12	<i>How do we define our own collection classes?</i> Designing Abstractions	Chapter 6	Assignment 4 Due Assignment 5 Out Midterm 1 Out
Sunday, February 14			Midterm 1 Due
Monday, February 15	<i>Presidents' Day; No Class</i>		
Wednesday, February 17	<i>How do single variables hold multiple values?</i> Dynamic Allocation Implementing Stack	Chapter 11 Chapter 12.1	
Friday, February 19	<i>How does data representation impact efficiency?</i> Optimizing the Stack		Assignment 5 Due Assignment 6 Out
Monday, February 22	<i>How can we harness hard-to-predict functions?</i> Hash Functions Chained Hashing	Chapter 15	
Wednesday, February 24	<i>What else is possible in hashing?</i> Linear Probing Robin Hood Hashing		
<i>Part Six: Linked Lists</i>			
Friday, February 26	<i>How do we form sequences from individual elements?</i> Linked Lists Recursive Data Types	Chapter 12	Assignment 6 Due Assignment 7 Out
Monday, March 1	<i>What tradeoffs exist in data representation?</i> Iterating Over Linked Lists	Chapter 13	
Wednesday, March 3	<i>How do we transfer data between groups?</i> Pointers by Reference Tail Pointers		
<i>Part Seven: Binary Trees</i>			
Friday, March 5	<i>How can we efficiently store data in sorted order?</i> Binary Search Trees, Part I	Chapter 16.1 – 16.2	Assignment 7 Due Assignment 8 Out
Monday, March 8	<i>How can we efficiently search data in sorted order?</i> Binary Search Trees, Part II	Chapter 16.3 – 16.4	

Date	Topics	Readings	Assignments
Wednesday, March 10	<i>How are trees useful outside of data structures?</i> Huffman Encoding		
<i>Part Eight: Looking Forward</i>			
Friday, March 12	<i>How do we model and represent networks?</i> Graphs Graph Searches	Chapter 18	Assignment 8 Due Assignment 9 Out Midterm 2 Out
Sunday, March 14			Midterm 2 Due
Monday, March 15	<i>How do we make sense of complex data?</i> Clustering Algorithms Kruskal's Algorithm		
Wednesday, March 17	<i>What comes after CS106?</i> Where to Go from Here		
Friday, March 19	<i>No class today – congrats on finishing the quarter!</i>		Assignment 9 Due