**Semester 1:**

1. Introduction
2. Data Abstraction
3. Basic IO
4. Math
5. Functions
6. Control Flow
7. Loops/Recursion

**(1-1.5 week) Mini Project – Root finding program**

1. Reference parameters & Fundamental Arrays
2. File IO & Advanced IO
3. Multidimensional Arrays & Sorting

**(2-2.5 weeks) Project – Basic Maze Game**

1. Pointers, memory, and casting
2. Dynamic Memory
3. Structures
4. Classes
5. More Classes, friend functions/classes, and “const” stuff
6. Dev C++ Projects – Multiple Code Files, Makefile/Compilation options, Command Args

**Semester 2:**

1. Review

**(3-4 weeks) Project – Card Games**

1. Operator overloading
2. Linked lists
   1. Singly Linked lists
   2. Circularly linked lists
   3. Doubly linked lists
   4. Linked Trees
3. Templates/Generic Programming
4. Inheritance and Polymorphism
   1. Basics
   2. Multiple inheritance, abstract classes
5. C++ Strings
6. C++ Exceptions
7. C++11 range-based for loops, auto type, etc.
8. STL Containers
   1. Array, Vector, List
   2. Stack, Queue, Deque, Priority Queue
   3. Map, Set, Multimap, Multiset
   4. Hash Map, Hash Set, Hash Multimap, Hash Multiset
9. STL IO
   1. Streams – istream, ostream, stringstream, etc
10. STL Other
    1. Algorithms – sort, etc.
    2. Smart Pointers
    3. Time (chrono)
    4. RNG
11. STL Threading
    1. Threads
    2. Atomics
    3. Mutexes
12. Functors & Lambda Expressions

**Add in somewhere:** inline functions