

MTH 4300: Algorithms, Computers and Programming II

Fall 2025

Section: STRA

Course Outline

Remember that this is subject to change depending on how the pace changes throughout the semester.

Lecture	Topics
1	Compilation process and development environment setup; Hello, World!
2	C++ basics and syntax; variables, data types, and operators, basic I/O operations
3	Control structures (if-else, loops); <code>enums</code> ; arrays and vectors
4	Arrays and vectors; pointers and references
5	Pointers and references; functions and function overloading
6	STL (Standard template library): iterators and algorithms
7	Recursion
8	OOP: structs, classes, and methods
9	OOP: 4 pillars of OOP
10	Midterm 1
11	OOP: More on inheritance and virtual functions
12	OOP: Operator overloading
13	OOP: Templates and generics
14	Linked Lists
15	Stacks
16	Queues; Deques
17	Trees: Basic data structure and tree traversal algorithms
18	Trees: Binary search trees
19	Midterm 2
20	Heaps and Priority Queues
21	Hashing; Maps and Sets
22	More on maps and sets
23	Graph representations; Graph Traversal Algorithms
24	Shortest Path Algorithms
25	Union Find; Minimum Spanning Trees
26	Topological Sort
27	Final Exam Review 1
28	Final Exam Review 2