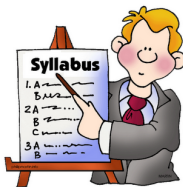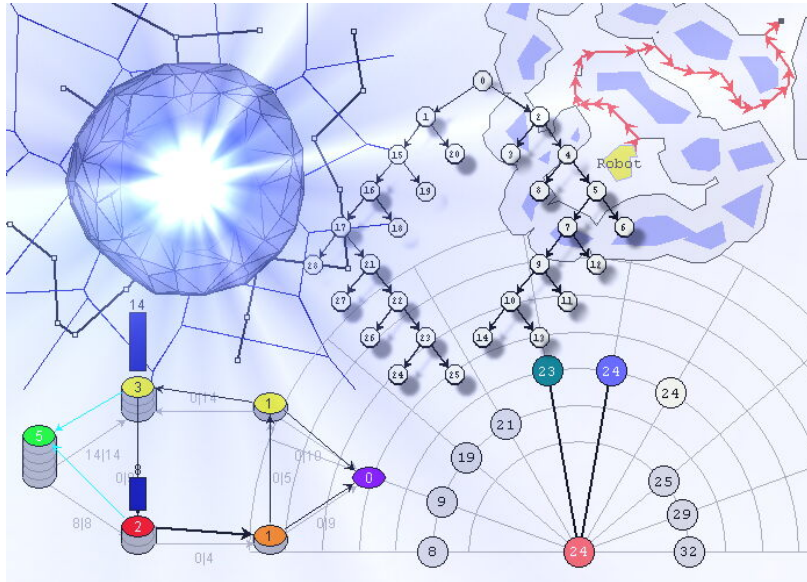# CIS 279

Algorithms and Data Structures in C++

 (https://smccd.instructure.com/courses/21015/assignments/syllabus)

Syllabus (click here or on image)
(https://smccd.instructure.com/courses/21015/assignments/syllabus)

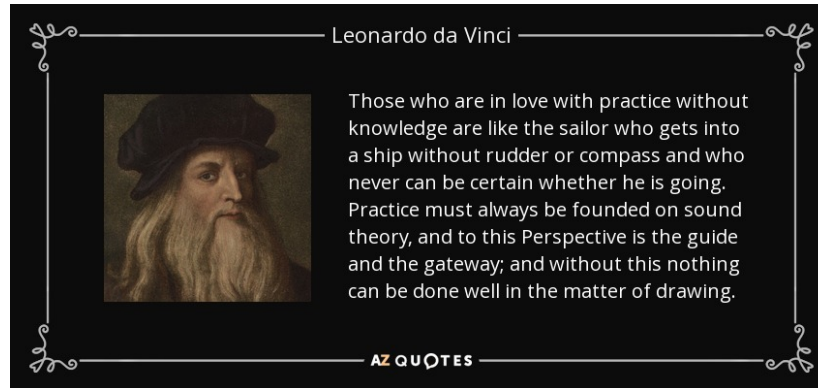 (https://smccd.instructure.com/courses/21015/pages/textbooks)

Textbooks (click here or on image) (https://smccd.instructure.com/courses/21015/pages/textbooks)

(https://smccd.instructure.com/courses/21015/discussion_topics/146773)

The Roman Forum for Class Participants Introductions (https://smccd.instructure.com/courses/21015/discussion_topics/146773)

 "Those who are in love with practice without knowledge are like the sailor who gets into a ship without rudder or compass and who never can be certain [where] he is going. Practice must always be founded on sound theory..."
— Leonardo da Vinci

Week 1 (January 14 - 20) ⇐ click here... (https://smccd.instructure.com/courses/21015/pages/week-1-january-14-20)

Syllabus (https://smccd.instructure.com/courses/21015/assignments/syllabus)

Course Introduction

Why Study Algorithms and Data Structures?

Disjoint Set Union - A Motivating Example About Network Connectivity

Week 2 (January 21 - 27) (https://smccd.instructure.com/courses/21015/pages/week-2-january-21-27)

The Analysis of Algorithms

Week 3 (January 28 - February 3) (https://smccd.instructure.com/courses/21015/pages/week-3-january-28-february-3)

Elementary Data Structures: Stacks and Queues

Week 4 (February 4 - 10) (https://smccd.instructure.com/courses/21015/pages/week-4-february-4-10)

Depth-First Search and Breadth-First Search

Backtracking and Brute-Force Algorithms

Programming Project #1 - Stacks and Queues (10% of course grade) (https://smccd.instructure.com/courses/21015/assignments/294531)

Week 5 (February 11 - 17) (https://smccd.instructure.com/courses/21015/pages/week-5-february-11-17)

Elementary Sorting Methods

Divide and Conquer Algorithms

Recursion

Mergesort

Week 6 (February 18 - 24) (https://smccd.instructure.com/courses/21015/pages/week-6-february-18-24)

Divide and Conquer Algorithms (continue)

Quicksort

Binary Heaps, Priority Queues and Heapsort

Week 7 (February 25 - March 3) (https://smccd.instructure.com/courses/21015/pages/week-7-february-25-march-3)

Discrete Event-Driven Simulation

Programming Project #2 - Priority Queues (10% of course grade)

"Ancora Imparo"
"I'm still learning"
- Michelangelo
from Italian

The great Michelangelo was credited for saying the phrase "ancora imparo" which means "I am still learning." In fact, at the ripe age of 87, Michelangelo wrote this inscription on a sketch he was working on.

Week 8 (March 4 - 10) (https://smccd.instructure.com/courses/21015/pages/week-8-march-4-10)

"Flex Day": No CSM Classes on Wednesday March 6

Binary Trees (Part 1)

Week 9 (March 11 - 17) (https://smccd.instructure.com/courses/21015/pages/week-9-march-11-17)

Midterm Exam - Wednesday March 13, 2019 (25% of Course Grade)

Week 10 (March 18 - 24) (https://smccd.instructure.com/courses/21015/pages/week-10-march-18-24)

Binary Trees (Part 2)

Balanced Binary Search Trees

Week 11 (March 25 - 30) (https://smccd.instructure.com/courses/21015/pages/week-11-march-25-30)

Hash Tables

Assignment #3 - Balanced Search Trees and Hashing (10% of course grade)

Spring Break (March 31 - April 7)

California's Pacific Coast covered by fog and the Big Sur covered with blue lupine.

"I'd gone to Big Sur to watch the gray whale migration from the cliffs, but it was too foggy to even see the water. I decided to hike up the Baronda Trail to see if I could get above the fog. This view was my reward. Miles of lupine and blue skies. Outstanding!"

-- Douglas Croft for National Geographic

Week 12 (April 8 - Nov 14) (https://smccd.instructure.com/courses/21015/pages/week-12-april-8-nov-14)

Undirected Graphs

Week 13 (April 15 - 21) (https://smccd.instructure.com/courses/21015/pages/week-13-april-15-21)

Directed Graphs

Week 14 (April 22 - 28) (https://smccd.instructure.com/courses/21015/pages/week-14-april-22-28)

Program Evaluation Review Technique (PERT) and Critical Path Method (CPM)

Programming Project #4 - Directed Acyclic Graphs (15% of course grade)

Week 15 (April 29 - May 5) (https://smccd.instructure.com/courses/21015/pages/week-15-april-29-may-5)

Greedy Algorithms

Week 16 (May 6 - 12) (https://smccd.instructure.com/courses/21015/pages/week-16-may-6-12)

Dynamic Programming Algorithms

Week 17 (May 13 - 19) (https://smccd.instructure.com/courses/21015/pages/week-17-may-13-19)

Reductions and Intractibility

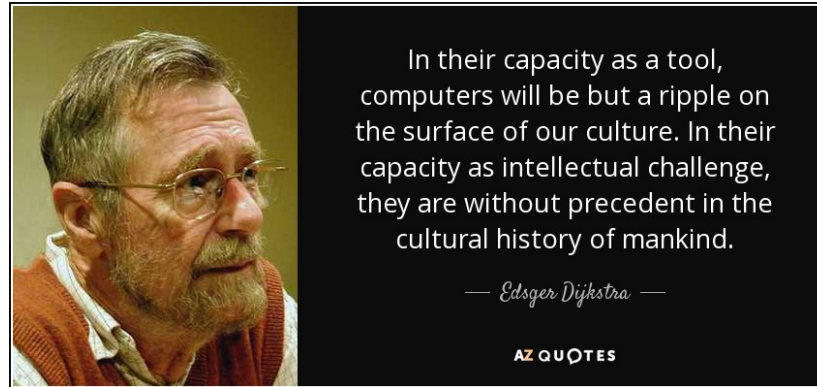**Week 18 (May 20 - 24)** (https://smccd.instructure.com/courses/21015/pages/week-18-may-20-24)

Final Exam - Wednesday May 22, 2019 (30% of Course Grade)

Final Exam Information

Edsger W. Dijkstra — In Pursuit of Simplicity

One of the most influential figures of computing science's founding generation

Dijkstra's illuminating keynote address to the 1996 graduating class at the University of Texas at Austin concluded with the following wish:

> May, in spite of all distractions
> generated by technology,
> all of you succeed in turning
> information into knowledge,
> knowledge into understanding,
> and understanding into wisdom.

Edsger Dijkstra on universities   **(https://www.cs.utexas.edu/users/vl/notes/dijkstra.html)**