

# ALGORITHMS

CMPT 435 • Fall 2020

## -Background

When and where

**TOS** group: Wednesdays 8AM—9:05AM or **TNG** group: Fridays 11AM—12:05PM

Suggested Text

*Introduction to Algorithms*, 3<sup>rd</sup> edition by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein. Published by MIT Press.  
ISBN: 9780262033848

Web

<https://www.labouseur.com/courses/algorithms> and iLearn

Instructor

Alan G. Labouseur

Hancock 3007

(Office hours are online.)

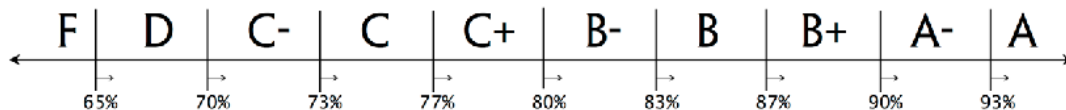
Alan.Labouseur@Marist.edu

845-575-3832 Marist phone

845-440-1102 home office phone

## -Grading

Letter Grades



You can earn up to 1000 points over the course of the semester, broken down as follows:

Assignment 0	0.0%	0 points, but $-\infty$ if you skip it	[1, 2]
Assignments 1, 2, 3, 4, 5	50.0%	500 points (5 at 100 points each)	[1, 2]
Semester Project	10.0%	100 points	[1, 2]
Mid-term Exam	15.0%	150 points	[1, 2]
Final Exam	20.0%	200 points	[1, 2]
Attendance and Participation	2.5%	25 points for quality and quantity	[1]
Laziness and Whining	2.5%	25 points for not (lazy or whining)	[1]

## -Objectives and Assessment

Assessment methods include assignments, quizzes, exams, discussions, presentations, peer review, and projects.

[References] refer to Department of Computing Technology Goals available at <https://www.labouseur.com/courses/goals.pdf>

In this course, I hope that you will . . .

- gain and demonstrate an understanding of many fundamental concepts in the study of algorithms (including but not limited to sorting, searching, traversing trees and graphs, recursion, and dynamic programming) and their accompanying data structures [1, 2, 5];
- gain and demonstrate an understanding of asymptotics and their utility [2];
- gain and demonstrate an understanding of the techniques developing, analyzing, and proving correct different kinds of algorithms [1, 2];
- learn that developing the algorithms (and the software that is their implementation) is only half the battle, debugging and testing are critical skills for a talented professional, and skills that will be valuable. [1, 2]
- enhance your continuing education skills. Capable problem solvers never stop learning. You will get practice in finding answers for yourself. Additionally, preparation and presentation of the projects, as well as participation in class discussions and assignments, requires at least a little research, so there's that. [1, 2]

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-Proposed Schedule

#	Week		Due	CLRS	Topics	
	TOS	TNG				
0	26-Aug	28-Aug	—	1, 2	Studying, characterizing, and analyzing algorithms and data structures	
1	2-Sep	4-Sep	0: LaTeX Limericks	10.1 - 10.3	Elementary data structures: Linked lists, Stacks, and Queues	
2	9-Sep	11-Sep	—	3	Growth of functions and asymptotic notation Applying asymptotic notation to elementary data structures	
3	16-Sep	18-Sep	1: Data Structures	2.3, 7	Sorting Lists - {permutation/monkey, selection}	Asymptotic Analysis
4	23-Sep	25-Sep	—	2.3, 7	Quick sort, Merge sort, and Recursion trees	
4½	September 26 11:00AM online		—	—	Saturday Morning Special: <i>Algorithms with Alan</i> All students, online via Webex	
5	30-Sep	2-Oct	2: Sorting	2.3, 7	Detailed running time for Selection Sort and Quicksort	
6	7-Oct	9-Oct	—	—	<b>Mid-term Exam</b> , in our classroom One-page study sheet permitted. Some restrictions apply.	
7	14-Oct	16-Oct	—	10.2, 27.3, 11,	Searching with Linear and Binary search Hashing with chaining (and maybe probing)	
8	21-Oct	23-Oct	—	12 (13, 18)	Binary Search Trees (and other tree varieties)	Asymptotic Analysis
9	28-Oct	30-Oct	3: Searching and Hashing	22-24 22.2-3	Graphs and graph analytics Depth-first and breadth-first traversals	
9½	October 31 11:00AM online		—	—	Saturday Morning Special: <i>Algorithms with Alan</i> All students, online via Webex	
A	4-Nov	6-Nov	—	15	Dynamic Programming - Bellman-Ford SSSP	
B	11-Nov	13-Nov	4: Graphs and Trees	16	Greedy Algorithms - Fractional Knapsack	
C	18-Nov	20-Nov	—	—	<b>Comprehensive Final Exam</b> in our classroom One-page study sheet permitted. Some restrictions apply.	
D	25-Nov	27-Nov	—	—	<i>No class meetings: Thanksgiving</i>	
E	December 4 11:00AM online		5: Dynamic & Greedy	4.3 - 4.6	All students, online via Webex: The master method and its proof.	
F	December 11 online		Semester Project	—	All students, online via Webex: Show off your semester project, virtually.	