

ALGORITHMS

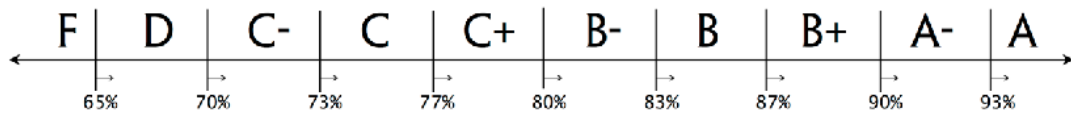
CMPT 435 • Spring 2019

-Background

When and where	Wednesdays 8AM—9:15AM and Fridays 11AM—12:15PM in HC 1021.	
Suggested Text	<i>Introduction to Algorithms</i> , 3 rd edition by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein. Published by MIT Press. ISBN: 9780262033848	
Web	http://www.labouseur.com/courses/algorithms	
Instructor	Alan G. Labouseur Hancock 3007 <i>Office hours are posted.</i>	Alan.Labouseur@Marist.edu 845-575-3832 <i>Marist phone</i> 845-440-1102 <i>home office phone</i>

-Grading

Letter Grades



You can earn up to 1000 points over the course of the semester, broken down as follows: (These weights are subject to minor variation.)	Assignment 0	5.0%	50 points	[1, 2]
	Assignments 1, 2, 3, 4	40.0%	400 points (4 at 100 points each)	[1, 2]
	Mid-term Exam	25.0%	250 points	[1, 2]
	Final Exam	25.0%	250 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 <http://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	
0	23-Jan	25-Jan	—	1	Introduction • Getting started • Frequently Asked Questions	
1	30-Jan	1-Feb	0: LaTeX Limericks	10	Elementary data structures: Linked lists, Stacks, and Queues	
2	6-Feb	8-Feb	—	3	Growth of functions and asymptotic notation Applying to elementary data structures	
3	13-Feb	15-Feb	1: Data Structures	2, 7	Sorting Lists - {bubble, insertion, merge, quick} sort	Asymptotic Analysis
4	20-Feb	22-Feb	—	10.2 27.3	Searching Lists - {linear, binary} search	
5	27-Feb	1-Mar	—	11	Hashing - with {chaining, probing}	
6	6-Mar	8-Mar	—	2.3 4	Divide and Conquer: Recurrences and the master method Maximum sub array • {quick/merge} sort • Recursion trees	
7	13-Mar	15-Mar	2: Sorting, Searching, Hashing	—	Mid-term Exam in two parts, in class One-page study sheet permitted. Some restrictions apply.	
-	20-Mar	22-Mar	—	—	<i>Spring Break</i>	
8	27-Mar	29-Mar	—	22-24	Graphs and graph analytics	Asymptotic Analysis
9	3-Apr	5-Apr	—	22.3 22.2	{Depth-first, breadth-first} traversals	
A	10-Apr	12-Apr	—	12, 13, 18	{Binary, Red-Black, B-} trees	
B	17-Apr	19-Apr	3: Graphs and Trees	15	Dynamic Programming	
C	24-Apr	26-Apr	—	16	Greedy Algorithms	
D	1-May	3-May	—	4.5 4.6	Revisit the master method and consider its proof.	
E	8-May	10-May	4: Dynamic & Greedy	—	Review everything	
F	May 15 8:00am		—	—	Comprehensive Final Exam in our classroom One-page study sheet permitted. Some restrictions apply.	