

# ALGORITHMS & DATA STRUCTURES

**CSE/IT 122**

# ABOUT INSTRUCTOR

## → Amy Knowles

- Instructor in Computer Science Department
- Office: Cramer 210A
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- Discord: Yuki#7543

## → Research Interest

- Computational Physics
- 3-D Interactive Graphics
- Visualization

## → Women in Computing

# OFFICE HOURS

## → Monday

- 09:00 ~ 10:00

## → Tuesday

- 14:00 ~ 16:00

## → Wednesday

- 09:00 ~ 10:00

## → Thursday

- 14:00 ~ 15:00

## → Friday

- 09:00 ~ 10:00

# ABOUT THE COURSE

- Time: Monday, Wednesday, Friday 11:00 - 11:50
- Location: Cramer 239
- Goal:
  - The topics in this class include induction, recurrence relations, Big- $O$  notation, an introduction to the analysis of algorithms, Abstract Data Types (ADT), heaps, hashing, and sorting and search algorithms.

# LEARNING OBJECTIVES

- Use math to prove statements about natural numbers and how it relates to recursion
- Determine the performance of an algorithm using Big- $O$  notation
- Use recurrence relations to find the Big- $O$  of recursive algorithms
- Use opaque, function, and void pointers to produce ADTs (lists, stacks, queues, AVL trees) in C

# LEARNING OBJECTIVES

- Explain the difference between various linear and non-linear data structures
- Compare and contrast how binary, binary search, self-balancing trees work
- Use recursion to program various tree operations
- Explain how hashing works
- Use an array of pointers to implement hashing via chaining

# LEARNING OBJECTIVES

- Explain how heaps and heapsort work
- Implement a heap and a heapsort
- Discuss the pros and cons in terms of the performance of various sorting algorithms

# COURSE OUTLINE

- Induction
- Analysis of Algorithms
- Recurrence Relations
- Void Pointers, Function Pointers and Opaque Data Types
- Stacks and Queues
- Heaps and Heapsort
- Hashing
- Trees
- Sorting Algorithms



# ASSIGNMENT SUBMISSION

## → Canvas

- All Assignments should be submitted on Canvas
- Each assignment will have a 24 hour grace turn-in period
- 4 **Late Days** with no penalty

## → Grading

Assignment Breakdown	Grading Scale
Assignments: 45%	90.00 - 100.00 ~ A
Quizzes: 5%	80.00 - 89.99 ~ B
Project: 10%	70.00 - 79.99 ~ C
Midterm: 15%	60.00 - 69.99 ~ D
Final: 25%	0 - 59.99 ~ F

# ACADEMIC HONESTY

## → Do Not:

- Copy in part or totality another person's assignment and submit it as your own work
- Allow someone else to copy your work and submit it as their own
- Allow someone else to do all or part of the work for you
- Submit the work of a group as your own
- Share any of your work (assignments, code, etc) with any other student, including through posting it on the internet

# ACADEMIC HONESTY

## → Possible Retribution

- Zero credit for part or all of the plagiarized work for any or all parties involved
- Report to Academic Affairs of the incident
- Failure of the Course
- Other courses of action as covered by the NMT Academic Honesty Policy

# SUPPORT FOR ASSIGNMENTS

## → Tutoring Room

- Cramer 213
- <https://www.cs.nmt.edu/tutoring/>

# DISCORD SERVER

- Discord Server: CSE 122 - ADT
  - <https://discordapp.com/invite/GB9kcPs>
- Installing Discord
  - <https://discordapp.com/>
- 08:00 ~ 20:00 response window
- Gain access to our discord server by the end of the week

# FIRST ASSIGNMENT

- Gotta get back into the C groove
- CSE 113: Lab 11
- Due: **Wednesday January 23, 2019**