

# CSCE 411

# Design and Analysis of

# Algorithms

*You can already log into Canvas and download a blank set of lecture notes that we will fill in today.*

*lec-1-blank.pdf*

# What is this course about?

**Designing** algorithms to solve computational problems

**Analyzing** algorithms (correctness, runtime, space requirements)

**Analyzing** the inherent **complexity** of computational problems

*More on this in later slides!*

# Prerequisites

CSCE 221 Data Structures and Algorithms

CSCE 222/ECEN 222 Discrete Structures for Computing

I.e., you should already be somewhat familiar with algorithms and how to analyze them!

# So how is this course different and new?

- More advanced design patterns and algorithms

*Divide and conquer, Dynamic programming, Greedy algorithms, Graph Algorithms, etc.*

- More in depth and rigorous analysis

*You can basically view this as a math course!*

- Computational complexity questions

*How can we prove results about the inherent hardness of a computational problem that are independent of the algorithm you use?*

*Little to no actual programming will be required (though you may find you still want to sometimes!)*

First: a speed walk through the syllabus

*You are responsible for knowing and following the course policy details in the syllabus!*

This will be a brief overview to get you familiar with the overall logistics of the course.

You will need to read the syllabus (and complete a syllabus quiz) to get the full details.

# Assignment schedule

- **There will be 9-10 homework sets**
  - Due most weeks on Friday, starting next week
  - Typically posted one week ahead of time
  - No homework on test weeks
  - Turn in on Gradescope (can be accessed through Canvas)
- **There will be two in-class midterms.**
  - Test 1: February 12 (Thursday)
  - Test 2: April 2 (Thursday)
- **The final exam will be on Tuesday, May 5: 3:30 pm – 5:30 pm**

# Homework collaboration policy

**Students may collaborate on homework, under the following requirements**

- ***You may*** discuss solution strategies.
- ***You must*** write up your own solution in your own words  
*Do not* copy down the same solution!
- ***You must*** disclose on your homework who you worked with and one what problem.

You are responsible for knowing and following  
the course policy details in the syllabus!

# Outside resource policy

- ***You may*** use outside textbooks and existing written resource
  - This means you can read information on existing webpages
  - You are responsible for anything you write!
- ***You must*** write up your own solution in your own words
  - Do not*** copy down the same solution!
- ***You must*** disclose on your homework any outside resources used.

You are responsible for knowing and following  
the course policy details in the syllabus!

# CSCE 411: Design and Analysis of Algorithms

## Homework 5

*Due date: March 10*

*Name:*

**Problem 0.** (points removed for not answering) Write down all outside resources you consulted, and the names of any other students that you worked with in any way. By turning in this homework, you acknowledge that you have read and abide by all course policies on outside resources and collaboration as stated in the course syllabus. If you did not work with others or use outside resources, then write that down.

Homeworks will always begin with a “Problem 0” like this where you will list outside resources and outside help.

You must always answer this explicitly, even if just to say “I did not get outside help or use outside resources for this homework.”

You do not need to list (1) the textbook or (2) lecture notes. These are not “outside” help, these are the main resources for the course which you are expected to use.

# Late work and make-up policy

Homework may be submitted up to 1 day late for a penalty. Lowest homework grade is dropped. (Homeworks can be worth different amounts. I will drop the homework that is most beneficial for your grade)

Excused absences from tests require advance notification and formal verification (e.g., doctor's note).

The lowest homework will be dropped.

You are responsible for knowing and following  
the course policy details in the syllabus!

# Participation and Attendance

Attendance is **NOT MANDATORY**, but in-class polling questions do count towards your participation grade.

Participation can be met in many ways, the three primary ways are:

- In-class polling participation
- Submitting and intro video (Due next Friday!)
- Completing a simple syllabus quiz (Due next Tuesday!)

In-class polls can only be taken...in-class! If you answer a polling question while not in class (or your friend does it for you), that is an academic integrity violation.

# Grade breakdown

- *Participation:* 3%
- *Homework:* 22%
- *Test 1:* 24%
- *Test 2:* 24%
- *Final exam:* 27%

*The grading scale will be:  $A \geq 90\% > B \geq 80\% > C \geq 70\% > D \geq 60\% > F$ .*

# Course content

The course is structured roughly into three units, which for the most part line up with the three tests.

1. High-level design and analysis paradigms (Test 1, roughly)
2. Graph algorithms (Test 2, roughly)
3. Complexity and NP-completeness (Final exam, though the final is also cumulative so may include content from units 1 and 2 as well)

# Three assignments you should already have on your radar

1. **Intro video** – Due Friday, January 23 (11:59pm), uploaded on Canvas
2. **Syllabus quiz** – Due Tuesday, January 20 (11:59pm), on Canvas
3. **Homework 1** – Due Friday, January 23, on Gradescope. Will be released tomorrow (Friday). *Be sure to assign problems to pages on Gradescope so grader can find them.*

# How/where do I keep up with the course?

1. **In-class:** I will give frequent reminders about where we are logically in the course.
2. **Canvas:** for announcements, homework assignments, syllabus, any recordings, lecture notes (before and after class), accessing gradescope (do not trust the “grade” feature on Canvas though!!)
3. **Gradescope:** for turning in homework and checking homework grades and answers (*Be sure to assign problems to pages*)
4. **Campuswire:** mainly for in-class polls. Can also be used as a forum for course content questions and basic questions about homework (that do not reveal any partial answers).

# Use of AI in CSCE 411, Section 502

**General guideline:** you may use GenAI tools such as ChatGPT insofar as they are used to gain knowledge and understand a topic better, and are not used to simply generate an answer which is turned in as your work.

## Specific guidelines

- All AI tools are considered an outside resource and must follow course guidelines on collaborators and outside resources
- Students may not directly copy-paste any course lecture notes or homework problems as a prompt to an AI (this content is copyrighted)
- Students must be responsible for their own writing. AI is only allowed to slightly check or slightly refine writing already produced by the student  
Students must cite their use of all AI tools

# Use of AI in CSCE 411, Section 502

## **Short version**

- It's an outside resource (and kind of a collaborator). All prior rules apply
- Don't copy-paste questions into the AI tool
- Don't copy-paste answers from the AI tool
- Cite your sources (e.g., "I used ChatGPT, ensuring that I followed all course policies on Generative AI")

*These policies highlight what is allowed, and should in no way be viewed as an endorsement of AI tools nor an encouragement to use them for this course.*