

Fall 2023

## CPSC 481 - Midterm Exam Study Guide

The midterm will take place on **October 19<sup>th</sup> (Thursday)** during class hours in person. **You must be physically present in class to take the exam.** The exam will cover the material from **weeks 1 to 7.**

I will hold a **review session on October 17<sup>th</sup> (Tuesday)**. The best way to prepare for the exam is going through the homework, quizzes, and in-class exercises. You will not be expected to write any Pseudocode. I will allow you to bring up to **two pages of notes (double sided is okay)**.

**Any topic from below can be on the exam:**

1. Agents and environments
  1. Properties of task environments
2. State space
  1. State space graph
  2. Frontier operations
  3. Queues
  4. Branching factor
3. Uninformed search
  1. Depth-first tree search
  2. Depth-first tree search with loop checking
  3. Depth-first graph search
  4. Breadth-first graph search
  5. Depth limited search
  6. Iterative deepening
  7. Properties of algorithms
    1. Completeness
    2. Optimality
    3. Time complexity
    4. Space complexity
4. Informed search
  1. Heuristics
    1. Creating heuristics from relaxed problems
  2. Greedy Best First search
  3. A\* search
5. Adversarial search
  1. Types of games
  2. Game tree for 2-player games
  3. Minimax algorithm and utility value
  4. Evaluation function
  5. Alpha-beta pruning
6. Propositional logic
  1. Syntax, Well Formed Formula (WFF)
  2. Truth table enumeration
  3. Rules of inference

4. Conjunctive Normal Form (CNF)
  5. Proof by Resolution rule
7. Predicate logic
  1. Syntax
  2. Universal and Existential quantifiers
  3. Translating English to predicate logic
8. Ethics of AI
  1. Fairness and bias
  2. Privacy