# CPSC 131 Midterm Exam Study Guide

# Fall 2018

The midterm will take place **Wednesday/Thursday October 24/25** in class. It will cover the material from **weeks 1 through 7**.

You can expect the format of the exam to resemble that of our homeworks. Expect questions involving short answer, sketching data structures, stating big-*O* efficiency classes, and writing short C++ functions. The exam will be short enough that a prepared student should not feel any time pressure.

The exam is closed-books, closed-notes.

The following material is fair game:

1. Review of prerequisite material
   1. arrays
   2. pointers and references
   3. dynamic memory
   4. C memory model (stack vs. heap)
   5. Object-Oriented Programming (OOP) goals, principles, and terminology
   6. writing classes with proper encapsulation (public/private), data members, constructors, destructors, setters, getters, and other member functions
   7. exceptions and runtime error checking
   8. templates
   9. recursion
2. Terminology
   1. encapsulation
   2. abstraction
   3. wrapper/adapter class
3. Data structures and ADTs
   1. fixed-length vector
   2. iterator ADT
   3. singly linked list
   4. doubly linked list
   5. recursive list operations
   6. stack ADT
   7. stack based on a fixed-length vector
   8. stack based on a singly linked list
   9. queue ADT
   10. queue based on a doubly linked list
   11. queue based on a fixed-length vector (a.k.a. circular array)
   12. Extendable vectors
4. Analysis
   1. asymptotic analysis (big-*O*)
   2. deciding between and
   3. efficiency classes for the fundamental operations of all the data structures we’ve covered (be able to work them out; don’t memorize them)