



Algorithm Analysis and Development

<https://web.unbc.ca/casper/Semesters/2024-01W/200.php>

<https://moodle.unbc.ca/course/view.php?id=4275>



Prerequisites: A grade of C⁻ or better in CPSC 100, CPSC 101, CPSC 141, and CPSC 281; or permission of instructor.

Transitional Semester: This semester is the semester in which CPSC 281 precedes rather than follows CPSC 200. Some on-the-fly adjustments to topic order and timing may result from this.

Instructor: David Casperson; **Office:** TL 10-2050; **Phone:** 960-6672; **e-mail:** David.Casperson@unbc.ca ; **Office Hours:** M F 10:00–11:30 ;

Admin Assistant: Meagan Jago; **Phone:** 960-4690; **e-mail:** computerscience@unbc.ca ;

Lecture times: MWF 14:30–15:20. **Room:** 10-4044.

There are *no* assigned lab or tutorial times. Note that there are NO classes on • 2024-02-19 to 2024-02-23, • 2024-03-29, • 2024-04-01.

Text Book: [3] is *required* for this course.

References: [2] is a good JAVA resource book. [1] is difficult reading, but contains a wealth of information on list data-structures, algorithmic analysis and sorting algorithms.

Grading Scheme:

Homework:	25%	
Midterm 1:	20%	2024-02-07
Midterm 2:	20%	2024-03-06
Final Exam:	35%	3h in

I reserve the right to re-weight the components of the marking scheme. Your grade will always be at least as good as you would have had with the original weighting.

Academic Offenses: First offenses result in a grade of –100% and formal notification of the Faculty Dean. Allowing someone to copy your work is an offense. See the UNBC Calendar for official rules and details.

References

- [1] Donald E. Knuth, *Sorting and searching*, second ed., The Art of Computer Programming, vol. 3, Addison-Wesley, 1998.
- [2] Cay S. Horstmann, *Big java: Early objects*, 5th ed., Wiley Publishing, 2012.
- [3] Mark Allen Weiss, *Data structures and algorithm analysis in Java*, third ed., Addison-Wesley, 2012, for CPSC 200—2018.

Assignments: There are occasional written non-programming assignments (typically, math-like problems) throughout the semester.

There are medium-sized programming assignments during the semester. Familiarity with JAVA is assumed.

Syllabus: Material is mainly from Chapters 2–4 and 7 of [3], with other material as time permits. Topics include:

- Course introduction, loop invariants. (1 week)
- Algorithm analysis and asymptotic complexity (2 weeks).
- Java generics, strict week order. (1 week)
- Sorting algorithms, recursive algorithms (2 weeks).
- Containers, linked lists, stacks, queues, dequeues and iterators (2 weeks).
- Tree classes (1 week).
- Introduction to decidability, complexity, and complexity classes (1 week).

Times are approximate. More detail may be found on the moodle.unbc.ca site.