

University of Lethbridge
Department of Mathematics and Computer Science

Computer Science 4110/5110/7110 – Introduction to Algorithms in Facility Location
Course Outline – Fall 2017

LECTURES: Tu Thr 12:15 – 13:30 **ROOM:** L1168

INSTRUCTOR: Robert Benkoczi (office C556)
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TEXTS: There is no textbook for this course. Reading will be assigned from academic papers. It is important to take good notes during the lectures.

GRADING SCHEME:	Final exam	30%
	Midterm	20%
	Assignments (approx 5)	35%
	Project	15%

GRADE DISTRIBUTION: This information is provided as a guideline only and may be revised in this offering. Minimum percentages for each letter grade are:

A+	95	B+	77	C+	67	D+	55
A	85	B	73	C	63	D	50
A-	80	B-	70	C-	60	F	< 50

SCHEDULE:

(as time permits):

- 1) p -median and p -center problem in general graphs. Uncapacitated facility location (UFL) and covering problems, problem complexity.
- 2) Dynamic programming algorithms for the p -median and UFL in path and tree graphs. Data structures for tree graphs.
- 3) Prune and search, and parametric search algorithms for p -center problems in path and tree graphs. Linear-time algorithms for median finding.
- 4) Facility location in the geometric setting.
- 5) Obnoxious facility location; locating facilities with positive and negative weights.
- 6) A selection of project related topics, as per student interest: meta-heuristic and approximation algorithms, exact algorithms based on Integer Programming, facility location in dynamic graphs, etc.

COMMENTS:

- The class topics are common for graduate and undergraduate students; undergraduate student work and expectations will be at the appropriate level.

- Work must be submitted at the scheduled time; no provision is made for make-up midterm or late assignments, except for medical reasons or emergencies. Missed tests and assignments receive 0 points.
- Requests for remarking tests and assignments are accepted only in writing *no later than one week from the date your graded work was returned*. On the request: identify the assignment or midterm, briefly explain why you believe the mark is incorrect, date and sign. Note that if your work is remarked, your grade may go up, down, or remain unchanged.
- Copying is strictly prohibited. Plagiarism can lead to severe penalties – please consult the calendar.