

## CS 840 – Fall 2020

# Topics in Data Structures: Time and Space Efficiency

Instructor: I. Munro

This course will cover a number of recent results, as well as some older ones, on data structures and the algorithms acting upon them. Of particular interest will be the idea of using lower bounds, not to establish the impossibility of performing a task quickly, but to focus on the primitive operations one must have in order to achieve the desired bound. Particular interest: Lower bounds as a means to find algorithms

**Specific topics:**

- priority queues,
- techniques on search trees such as splay trees,
- "competitive" search structures,
- time and space efficient structures for text search,
- space efficient representations of trees,
- issues in memory management for data structures,
- specialized techniques for data compression
- comparison based complexity (e.g. sorting and selection)
- a variety of other issues depending on interests of the class.