

## CO446/646 Matroid Theory

This course is an introduction to classical matroid theory with applications to graph theory.

Topics include representable matroids; graphic matroids; duality; minors; graph matching; connectivity; characterizations of binary matroids and of graphic matroids; matroid intersection and its applications; extremal matroid theory.

**Instructor.** Jim Geelen (jim.geelen@uwaterloo.ca)

**Suggested reading.** *Matroid Theory*, First or Second Edition, James Oxley.

**Prerequisites.** A solid background in linear algebra is essential. This course is intended as an introduction to matroid theory for people who know and love graph theory. We do not use any results from graph theory, but we assume that students are familiar with various results in that area; in particular, students are expected to be familiar with matching theory (Konig's Theorem and Tutte's Theorem), connectivity (Menger's Theorem), planar graphs (duality and Kuratowski's Theorem), and extremal graph theory (Ramsey's Theorem and Turan's Theorem).

**Lectures.** The lectures will be hosted on Zoom (synchronously), and recordings of the lectures will be available through the course web page on Learn.

**Assessment.** The assessment will be based on assignments (individual and group); the exact model has yet to be determined. There is no exam.