Math 3157B-001 – Introduction to Game Theory

**Instructor:** David Riley  
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MC 136  
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**Office hours:** Mondays 3:30-4:00 or by appointment

**Class times:** Mondays, Wednesdays and Fridays 2:30-3:30

**Location:** UC-2110


**Prerequisites:** Math 1600A/B, Calculus 1301A/B or 1501A/B, and one of Math 1120A/B, 2120A/B, 2122A/B, 2124A/B, 2155F/G, or the former Math 2155A/B.

**Evaluation:** Assignments (5 x 5%), Midterm Exam (25%), Final exam (50%)

**Assignments:** Due at the start of class on: January 22, February 5, February 26, March 18, and April 1. No late assignments will be accepted.

**Midterm Exam:** March 4

**Final Exam:** Date to be determined

**Syllabus:** This course discusses how mathematical methods can be used to analyze various kinds of two-player games. Some topics include:

- how to model games: extensive and strategic forms; perfect information; chance
- strategies: backwards induction; Nash equilibria
- Nim, and the theory of Nim-like games (combinatorial games)
- modelling imperfect information
- von Neumann-Morgenstern utility functions
- mixed strategies, and domination of strategies
- optimization: matching problems, convex hulls, and maximizing functions on convex polyhedra
- cooperative games
Accommodation of missed work: If you are granted accommodation by the academic counsellors in your home faculty (dean's office) for a missed course component, then the following grade reweightings will apply:

- For each missed assignment, the number of assignments used to calculate that portion of your course mark will be reduced by one.
- For a missed midterm exam, there will be no make-up exam: the 25% weight will be added to the final exam weight.
- For a missed final exam, a special exam will be set by the Department of Mathematics.

Common course policies: Common policies for all undergraduate courses in the Department of Mathematics can be found here: https://www.math.uwo.ca/undergraduate/2019-20_math_common_course_policies.html. Please familiarize yourself with these policies.