MATH 344   GAME THEORY   FALL 2019

Basic info

Instructor: Omer Angel.
Contact: angel@math.ubc.ca
Lectures: MWF 12:00-12:50 at FNH 60.
Course webpage: `http://www.math.ubc.ca/~angel/344`
Office hours: M-F 10:30-11:30, Math annex 1210, or by appointment.
Discussion board: We will use a piazza discussion board this term. You can ask questions regarding the course there. It is encouraged to answer other students' questions there. Significant participation will receive extra credit. Obviously, **do not** share solutions to assignments (on piazza or elsewhere) before the due date.

Course outline

The course will discuss several mathematical aspects of the Game Theory, an important area of Mathematics with multiple applications to Economics, Political Science, Evolutionary Biology, and many other topics. The course will be based selected chapters from "Game Theory, Alive" By Karlin and Peres. The book is freely available from the authors at
`https://homes.cs.washington.edu/~karlin/index.html#Book`
See below for additional resources. Topics to be included:

1. Combinatorial games (Chess): extended and strategic forms, Sprague-Grundy theory, games with chance.
2. Zero-sum games: Matrix form, minimax theorem, pure and mixed strategies.
3. General sum games (Global Thermonuclear War): Nash equilibria, repeated games and evolutionary dynamics, incomplete information.
4. Coalition and Shapley values.
5. Auctions and mechanism design.
6. Social choice: voting, Arrow's theorem, stable matchings.

Evaluation

The final mark will be based on homework (1/6), mid-term (1/3) and the final exam (1/2). Additional credits may be given for participation in class or in the piazza discussion board.

Homework: Weekly assignments will be given. These are due at the **beginning** of class on the due date. Assignments handed in later the same day will receive 50% of the mark. No later assignments be accepted for credit. The single lowest assignment grade will be disregarded.

Mid-term: A mid-term will take place during class at a date to be determined.

Final Examination: will take place in the December examination period. Please do not make travel plans before the exam schedule is announced.

Missed midterms and assignments: There is no make-up midterm or assignments. Missing the midterm for a valid reason normally results in the weight of the midterm being transferred to the final exam. Personal travel and work conflicts are not considered valid. A student who misses the midterm must submit the Department of Mathematics self-declaration form within 72 hours of the midterm date. See the UBC Senate's Academic Concession Policy V-135. **A student who misses the midterm and has not completed a substantial portion of the term work shall not be admitted to the final examination.**