

## Political Science 681: Game Theory I

Room: 5769 Haven Hall

University of Michigan Winter 2017

Instructor: Scott A. Tyson

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Office Hours: Tuesday 1-3

**Course Description:** In this graduate course we will cover elementary topics in game theory aimed at the level of a first-year PhD course for political scientists.

**References and Texts:** Although I am not assigning a specific textbook there are several available texts that you might find useful:

- Mas-Colell, A., Whinston, M. D., Green, J. R., et al. (1995). *Microeconomic theory*, volume 1. Oxford university press New York
- Gibbons, R. (1992). *Game theory for applied economists*. Princeton University Press
- McCarty, N. and Meirowitz, A. (2007). *Political game theory: an introduction*. Cambridge University Press
- Kreps, D. M. (1990). *A Course in Microeconomic Theory*. Princeton University Press
- Milgrom, P. and Shannon, C. (1994). Monotone comparative statics. *Econometrica: Journal of the Econometric Society*, pages 157–180
- Fudenberg, D. and Tirole, J. (1991). *Game theory*. MIT press Cambridge, MA
- Myerson, R. B. (2013). *Game theory*. Harvard university press
- Kreps, D. (1988). *Notes on the Theory of Choice*. Westview press

**Grades:** Your grade in the course will be determined by performance in (1) problem sets, (2) a midterm exam, and (3) a final exam. The grading scheme is as follows:

Problem Sets (50%)

Midterm Exam (20%)

Final Exam (30%)

### Schedule of Topics:

- Preliminaries
  - Theory & Political Science
- Decision Theory
  - Preference Relations
  - Preferences & Utility

- Utility Maximization
- Choice Under Uncertainty
- Monotone Comparative Statics
- Complete Information Games
  - Normal-form Games & Nash Equilibrium
  - Extensive-form Games & Subgame Perfection
- Incomplete Information Games
  - Types, Beliefs, & Bayesian Nash Equilibrium
  - Sequential Rationality & Belief Refinement
- Applications
  - The Principal Agent Model
  - Markov Perfect Equilibrium

**Accommodations for Students with Disabilities:** If you think you need an accommodation for a disability, please let me know at your earliest convenience. Some aspects of this course, the assignments, the in-class activities, and the way the course is usually taught may be modified to facilitate your participation and progress. As soon as you make me aware of your needs, we can work with the Services for Students with Disabilities (SSD) office to help us determine appropriate academic accommodations. SSD (734-763-3000; <http://ssd.umich.edu>) typically recommends accommodations through a Verified Individualized Services and Accommodations (VISA) form. Any information you provide is private and confidential and will be treated as such.

**Religious and Academic Conflicts:** Although the University of Michigan, as an institution, does not observe religious holidays, it has long been the University's policy that every reasonable effort should be made to help students avoid negative academic consequences when their religious obligations conflict with academic requirements. Absence from classes or examinations for religious reasons does not relieve students from responsibility for any part of the course work required during the period of absence. Students who expect to miss classes, examinations, or other assignments as a consequence of their religious observance shall be provided with a reasonable alternative opportunity to complete such academic responsibilities.

It is the obligation of students to provide faculty with reasonable notice of the dates of religious holidays on which they will be absent. Such notice must be given by the drop/add deadline of the given term. Students who are absent on days of examinations or class assignments shall be offered an opportunity to make up the work, without penalty, unless it can be demonstrated that a make-up opportunity would interfere unreasonably with the delivery of the course. Should disagreement arise over any aspect of this policy, the parties involved should contact the Director of Undergraduate Studies/Director of Graduate Studies. Final appeals will be resolved by the Provost.

**Students Representing the University of Michigan:** There may be instances when students must miss class due to their commitment to officially represent the University. These students may be involved in the performing arts, scientific or artistic endeavors, or intercollegiate athletics. Absence from classes while representing the University does not relieve students from responsibility for any part of the course missed during the period of absence. Students should provide reasonable notice for dates of anticipated absences and submit an individualized class excuse form.

**Student Mental Health and Wellbeing:** University of Michigan is committed to advancing the mental health and wellbeing of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of support, services are available. For help, contact Counseling and Psychological Services (CAPS) at (734) 764-8312 and <https://caps.umich.edu/> during and after hours, on weekends and holidays, or through its counselors physically located in schools on both North and Central Campus. You may also consult University Health Service (UHS) at (734) 764-8320 and <https://www.uhs.umich.edu/mentalhealthsvcs>, or for alcohol or drug concerns, see [www.uhs.umich.edu/aodresources](http://www.uhs.umich.edu/aodresources).

For a listing of other mental health resources available on and off campus, visit: <http://umich.edu/~mhealth/>.

**Academic Integrity:** The LSA undergraduate academic community, like all communities, functions best when its members treat one another with honesty, fairness, respect, and trust. The College holds all members of its community to high standards of scholarship and integrity. To accomplish its mission of providing an optimal educational environment and developing leaders of society, the College promotes the assumption of personal responsibility and integrity and prohibits all forms of academic dishonesty and misconduct. Academic dishonesty may be understood as any action or attempted action that may result in creating an unfair academic advantage for oneself or an unfair academic advantage or disadvantage for any other member or members of the academic community. Conduct, without regard to motive, that violates the academic integrity and ethical standards of the College community cannot be tolerated. The College seeks vigorously to achieve compliance with its community standards of academic integrity. Violations of the standards will not be tolerated and will result in serious consequences and disciplinary action.

**Grade Grievances:** If you believe a grade you have received is unfair or in error, you will need to do the following:

1. Wait 24 hours after receiving the grade before approaching your instructor.
2. Provide an explanation in writing for why the grade you received was unfair or in error.
3. If you believe the instructors response fails to address your claim of unfairness or error, you may petition the departments Director of Undergraduate Studies at the latest within the first five weeks of classes following the completion of the course. You must convey in writing the basis for the complaint, with specific evidence in support of the argument that the

grade either was given in error or was unfairly determined. This formal complaint also should summarize the outcome of the initial inquiry to the course instructor, indicating which aspects are in dispute. Within three weeks of the receipt of the petition, the DUS will determine whether to convene the Undergraduate Affairs Committee, the student, and the instructor(s) for a formal hearing. Further details on this process are included on the department website under Advising & Contesting a Grade.