Course Description: The course will focus on non-cooperative game theory. Static, dynamic and repeated games of perfect and imperfect information will be covered in detail. Nash equilibrium and related concepts (subgame perfection, Bayesian and perfect Bayesian equilibria, the Folk Theorem) will play a central role. Applications from economics, political science and other disciplines will be considered.

Meeting Times: Monday/Wednesday, 3:30-4:45, 216 DeBartolo Hall.

Course Web site: http://www.nd.edu/~tjohns20/gametheory.html

Textbook: The game theory curriculum is very standard, so there are three books you might use:

- “Games, Strategy, and Decision-Making”, by Joseph Harrington. This is the text carried by the bookstore, and is a friendly introduction to game theory. This is best if you find economics challenging or want something a reference that’s presented in class to fall back on.

- “An Introduction to Game Theory”, by Martin Osborne. This book is more challenging, but there are many problems in it, and a publicly available solution manual.

- “Game Theory for Applied Economists”, by Robert Gibbons. This book is more abstract, but shorter and is extremely clear. If like math or think you might continue studying econ at a master’s or PhD level, this is the book for you.

Grading Procedures: There will be 6 graded problem sets, a midterm exam, and a final. The problem sets are:

- 1: Strategic-Form Games, Strategy Dominance, Pure-Strategy Nash Equilibrium
- 2: Mixed-Strategy Nash Equilibrium
- 3: Continuous Games
- 4: Dynamic Games
- 5: Bayesian Nash Equilibrium
- 6: Perfect Bayesian Equilibrium and Signaling Games

Here is the point breakdown:
Problem Sets: 20/100
Exam 1: 40/100
Final Exam: 40/100

Final grades will be assigned as follows: 0-59, F; 60-69, D; 70-79, C; 80-89, B; 90-100 A. 0-2, -; 7-9 +.

Prerequisites: There will be extensive calculations and quantitative reasoning. Calculus and intermediate microeconomics are required. It is not enough just to have these courses on your transcript; you do actually have to remember the skills from these courses. From math: Finding derivatives and integrals of “common” functions, taking limits, finding maxima and minima of functions, and solving constrained optimization problems. From economics: The theories of perfect
competition (supply/demand models) and monopoly, rational choice and expected utility theory, and decision-making over time.

**Academic Integrity:** Cheating and plagiarism will not be tolerated in this course. You are encouraged to work with other students on problem sets and seek help from me, but any work you turn in should be your own.

**Absences and Make-up Exams:** If you need to miss an exam, documentation is required.

**Students with Disabilities:** If you are entitled to special arrangements for exams, please get in touch with me as soon as possible so we can make the proper preparations.