Instructor: Thorsten Janus
Office: BU 267, West Building
Contacts: Office phone 766-3384, email tjanus@uwyo.edu
Office Hours: TTH 3-4:30PM or by appointment
Course Homepage: www.uwyo.edu/tmjanus

Required reading:
• Research Papers, which will be available in a Dropbox folder.

Optional resources:
• For another good graduate textbook, see An Introduction to Game Theory, by M. J. Osborne, Oxford University Press, 2003;
• For solved exercises, course notes, and more, see www.gametheory.net
• For an open courseware MIT course in game theory, click here

Course Description: Game theory is the study of strategic interactions. For example, regulators and firms, corporations, politicians, community members who engage in public good provision and common pool resource extraction, and governments that negotiate environmental, trade, defense, migrant labor or other agreements may all engage in strategic interactions. In the course of those interactions, they must try to anticipate their opponents’ strategies and choose their own strategies accordingly. The field of game theory provides a conceptual and analytical framework that seeks to describe situations with strategic interactions and to explain and predict the strategy choices and outcomes we should expect to observe. While most of the research in the field studies situations where the game is exogenously determined, the subfield called mechanism design studies how to design a game when the other player has an information advantage.

Course goals: The students should learn the concepts and analytical tools associated with game theory, and how to use them to formally model and analyze strategic interactions. In addition to learning the formal concepts and methodology, they should learn to identify the strategic aspects of economic and other issues they wish to understand and analyze, and to understand the intuitions that underlie that different concepts and discussions in the game theory field.
Learning Objectives: Students must learn the following:
- The concepts of players, strategies, timing, information sets and payoffs in games
- The concepts of simultaneous and sequential move games, including repeated, asymmetric information, voting and bargaining games as well as mechanism design
- The solution concepts games can be solved with, such as Nash, subgame perfect Nash, perfect Bayesian Nash and sequential equilibrium
- The principles of evolutionary game theory
- The principles of cooperative game theory
- The ability to write an applied game theory research paper

Grading Policy and Requirements:
- A set of homework and potentially other assignments
- A midterm
- Either a final exam or a research paper with journal potential

| Homework and other assignments | 30% of the course grade |
| Midterm | 35% of the course grade |
| Final exam or research paper | 35% of the course grade |

The course schedule below provides the tentative due dates for the homework and the exams, and the exam dates are provided in the course schedule below. Since the research paper is the most important Course component. I will therefore shortly request individual appointments with you to discuss the potential topics you may be interested in and try to assist your paper progress with follow-up meetings during the semester.

Final Exam Time: Tuesday, May 10 from 1:15 pm - 3:15 pm

Course Homepage: My website at www.uwyo.edu/tmjanus will link to the syllabus and game theory resources.

Course Schedule: The tentative course schedule is shown below.

Optional reading on special topics:
**Attendance Policy:** Attendance is not required, but if you miss a class meeting, you are expected to acquire the information you missed, including announcements and the lecture material, on your own.

**Academic Dishonesty:** Academic dishonesty will not be tolerated in this course, and violators will be found and disciplined to the fullest extent of University Regulations. Academic dishonesty includes

- representing the work, thoughts, and ideas of another person as your own;
- allowing another student to represent your work, thoughts, or ideas as theirs (yes, this includes copying your work before class);
- being *complicit* in academic dishonesty by suspecting or knowing of it and not taking action;
- giving or receiving assistance without authorization on any assignment or exam; or
- using unauthorized electronic devices or other material when prohibited from doing so.

Any case of academic dishonesty will be prosecuted in accordance with UNIREG 802 Rev. 2. Academic dishonesty can result in a permanent "F" in this course, a permanent notice of academic dishonesty in your student citizenship file, or suspension from the University. For more information on academic dishonesty, see University regulations.

**Student Services** – If you have a physical, sensory, cognitive, or psychological disability and require accommodations, please let me know as soon as possible. You will need to register with, and provide documentation of your disability to University Disability Support Services (UDSS) in SEO, Room 330, Knight Hall. You can also reach UDSS at 766-6189, TTY: 766-3073.

**Disclaimer:** the syllabus may be subject to change during the semester. If it is changed, you will be notified via an in-class announcement and/or email.
TENTATIVE SCHEDULE (MAY BE SUBJECT TO CHANGE)

Week 1, 1/26-1/28 What is Game Theory? The Rules of the Game and Essential Solution Concepts
Rasmusen Chapters 1

Week 2, 2/2-2/4 Information Structure in Games and Bayes’ Rule
Rasmusen Chapter 2

Week 3, 2/9-2/11 Subgame Perfect Nash Equilibrium
HW1 is due Thursday
Rasmusen Chapter 4

Week 4, 2/16-2/18 Mixed, Continuous and Correlated Strategies I
Rasmusen Chapter 3

Week 5, 2/23- 2/25 Mixed and Correlated Strategies II & Multi-Stage Games
HW 2 is due Thursday

Week 6, 3/1-3/3 Repeated Games
Rasmusen Chapter 5

Week 7, 3/8-3/10 Incomplete Information & Perfect Bayesian Equilibrium
HW 3 is due Thursday
Rasmusen Chapter 6

Week 8, 3/15-3/17 Spring break
Week 9, 3/22-3/24 Moral Hazard
Take home midterm is given out
Rasmusen Chapter 7

Week 10, 3/29-3/31 Adverse Selection
Take home midterm is due Thursday
Rasmusen Chapter 9

Week 11, 4/5-4/7 Signaling and Screening
Rasmusen Chapter 11

Week 12, 4/12-4/14 Bargaining
HW4 is due Thursday
Rasmusen Chapter 12

Week 13, 4/19-4/21 Mechanism Design
Rasmusen Chapter 10

Week 14, 4/26-4/28 Evolutionary Game Theory
HW5 is due Thursday
Rasmusen Chapter 5; section 5.6

Week 15, 5/3-5/5 Student Presentations
Final Exam: Tuesday, May 10 from 1:15 pm - 3:15pm