

**Apec 8003: Applied Microeconomic Analysis of Game Theory and Information  
Spring 2018**

**Instructor:** Terrance Hurley  
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**Hours:** 11:00 - 12:00 Monday/Wednesday  
By Appointment

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**Hours:** 10:30 - 11:30 Tuesday/Thursday  
By Appointment  
**Where:** Waite Library

**Lecture:** Tuesday/Thursday  
**Time:** 3:00 – 4:15 pm  
**Where:** Ruttan Hall B22

**Recitation:** Thursday  
**Time:** 4:30 – 5:45 pm  
**Where:** Ruttan Hall B22

**Description:** Applied Economics (APEC) 8003 is the third of four courses in the APEC 8001-2-3-4 sequence. It is designed to provide first year Ph.D. students in Applied Economics, Carlson School of Management, Health Policy & Management and other programs with a mathematical treatment of fundamental microeconomic concepts that are used extensively in applied research. The focus of this course will be situations where there are multiple individuals or firms whose actions affect the outcomes of other individuals or firms (“strategic interactions”). Strategic interactions arise in a wide range of economic situations: auctions, bargaining, common property resources, duopoly, and externalities. Strategic interactions require individuals or firms take account of the choices of others in making their own choices. This makes situations with strategic interactions more complex than those without such interactions (e.g., perfect competition or monopoly). Game theory is the standard tool for analysis of strategic interactions and will form the core of the material covered. The other major theme of this portion of the core sequence involves information. The information that individuals and firms have when they must choose an action can affect what they choose to do. The strategic use of information is another important component of strategic interactions.

**Recommended Texts:** This course will be based on the instructor’s notes posted on the class Canvas site. These notes and homework assignments borrow extensively from:

Fudenberg, D. and J. Tirole (**FT**). *Game Theory*. 1991.  
Gibbons, R. *Game Theory for Applied Economists*. 1992.  
MasColell, Winston, & Green (**MWG**), *Microeconomic Theory*, 1995.  
Varian, *Microeconomic Analysis (3<sup>rd</sup> edition)*, Norton, 1992.

You may also want to consider perusing

Roger Myerson, *Game Theory: Analysis of Conflict*, Harvard University Press, 1991 (**More Rigorous**).  
Dixit and Nalebuff. *Thinking Strategically: The Competitive Edge in Business, Politics, and Everyday Life*, Norton, 1993. (**More Intuitive**).

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Joel Watson, *Strategy, An Introduction to Game Theory*, W.W. Norton and Company, 2013.  
(*More Intuitive*).

While I suspect you will find the course notes indispensable for the homework assignments and test, you are strongly encouraged to read material from these other resources (especially Gibbons) to expand your perspective and further develop your understanding.

**Prerequisites:** The economics and mathematical background assumed for students enrolling in this class includes intermediate or M.S. level microeconomic theory (e.g., APEC 3001, ECON 3101 or APEC 5151); APEC 8001-8002 or equivalent coursework; linear algebra (e.g., MATH 2243); and multivariate calculus (e.g., MATH 2263).

**Homework:** There will be homework assignments associated with each course module. Each question on each homework assignment will be equally weighted. Due dates will be for each assignment will be one week after the completion of the module. Late homework will not be accepted. Turn in whatever you have had the chance to complete. Homework assignments and their solutions will be posted on the class Canvas site. You are encouraged to work together on homework assignments, but are required to submit your own.

**Exams:** There will be one closed book exam on Thursday, March 1, 2018 from 3:00 – 5:00 pm in Ruttan Hall B22.

**Grades:** Individual grades A – F will be assigned based on homework assignments (50%) and the exam (50%). Students taking the course on the S-N grade basis must achieve at least a C- to earn an S. No incompletes will be offered. No opportunities for extra credit will be offered.

**University Course Policies:**

[policy.umn.edu/Policies/Education/Education/SYLLABUSREQUIREMENTS\\_APPA.html](http://policy.umn.edu/Policies/Education/Education/SYLLABUSREQUIREMENTS_APPA.html)

**Modules in Order of Coverage:**

1. Markets and Market Power (Readings: **MWG** 10 A, C, G; **MWG** 12 A, B; Varian 13 & 14)
2. Describing Games of Strategy (Readings: **MWG** Chapter 7 and Hart 1992)
3. Solving Static Games of Complete Information (Readings: Gibbons 1; **MWG** 8 A, B, D, Appendix A; **FT** 1-2)
4. Solving Dynamic Games of Complete Information (Readings: Gibbons 2; **MWG** 9 A, B, and Appendix A; **MWG** 12 D, E, Appendix A; **FT** 3-5)
5. Solving Static Games of Incomplete Information (Readings: Gibbons 3; **MWG** 8 E; **FT** 6-7)
6. Solving Dynamic Games of Incomplete Information (Readings: Gibbons 4; **MWG** 9 C, D; **MWG** 13; **FT** 8.1-8.3, 9)
7. Additional Applications and Tricks of the Trade