Detailed Class Schedule with Recommended Practice Problems

Lectures are 2hrs twice a week. Recommended problem sets are posted at the beginning of the week and answers are posted a week later. Answers to some textbook problems are in the back of the textbook. N&S refers to *Microeconomic Theory: Basic Principles and Extensions* by Nicholas and Snyder.

I. **Lecture 1:** Intro, Choice Under Uncertainty
   a. **Main idea:** How do people make choices under uncertainty?
   b. **Applications:** Insurance, Crop Choice, Finance.
   c. **Texts:** Chapter 7 from Nicholas and Snyder
   d. Outline:
      i. Risk attitudes (risk neutral, averse, loving)
      ii. Expected Utility Theory
      iii. Certainty Equivalent
      iv. Application: Insurance
      v. Application: Portfolio Diversification
   e. Recommended Problem Set Topics: Crop yields, crop insurance vs. subsidies.
   f. **Practice Problems from Text:** N&S 7.5, 7.8, 7.9, 7.10 (challenge).

II. Lecture 2: Monopoly
   a. Main idea: How much is produced when there is a single buyer/seller?
   b. Applications: Government antitrust policy, industrial organization, utility companies, minimum wage.
   c. Texts: Chapter 14 from Nicholas and Snyder
   d. Outline:
      i. What is monopoly?
      ii. Entry barriers
      iii. Monopoly Model
      iv. Linear demand, quadratic cost solution
      v. Application: Monopsony and the Minimum Wage
      vi. Discussion: $15 national minimum wage
   e. Recommended Problem Set Topics: Monopoly with exponential demand, Monopoly price discrimination
   f. Practice Problems from Text: 14.1, 14.2, 14.3, 14.6 (good practice for segmented market), 14.10 – 14.12 (hard, but really good test practice).

III. **Lecture 3:** Primer on Static Game Theory
   a. **Main idea:** Give you the tools to understand more economic models
   b. **Application:** every other part of this class
   c. **Texts:** Chapter 8 in Nicholas and Snyder
   d. Outline
      i. What is a game: Players, payoffs, actions
      ii. Prisoner's Dilemma Example
      iii. Best-Response
      iv. Dominant Strategies
      v. Nash Equilibria
      vi. Mixed Strategy Nash Equilibria

vii. Continuous Actions

e. **Recommended Problem Set:** Tragedy of the Commons, 3 action game, Stag Hunt, R&D/pollution, Bidding for a dollar (very hard)

f. **Practice Problems from Text:** N&S 8.1a, 8.1b (for NE/mixed NE), 8.2 (for mixed NE), 8.5

IV. **Lecture 4:** Oligopoly, Static

a. **Main idea:** Model imperfect competition, where market power is less than monopoly.

b. **Outline**

i. What is an oligopoly?

ii. Price competition (Bertrand)

iii. Quantity competition (Cournot)

c. **Application:** Many product markets, including alcohol brewing, telecom, technology companies, automobiles.

d. **Texts:** N&S Chapter 15, 15.1 through 15.4

e. **Recommended problem Set Topics:** Cournot with variable number of firms, Bertrand with differentiated products.

f. **Practice Problems from Text:** 15.1,15.2**,**15.3, 15.4

V. **Lecture 5.1:** Midterm First Hour

VI. **Lecture 5.2 (After midterm):** Product Differentiation and Spatial Competition (this topic will for sure be on the final)

a. **Main Idea:** Firms can compete in ways other than price and quantity.

b. **Application:** product variety, news channels, political parties, location differences.

c. Outline

i. What is product differentiation/spatial competition?

ii. Bertrand with product Differentiation

iii. Hotelling Model

d. **Texts:** N&S Chapter 15, 15.5

e. **Recommended Problem Set Topics:** Salop Circle (very challenging) https://www.parisschoolofeconomics.eu/docs/caillaud-bernard/2016-io-2a-differentiation.pdf

f. **Practice Problems from Text:** 15.11a-d, 15.5, 15.13 (very challenging)

VII. Lecture 6: Finite Repeated Games

a. **Main idea:** Give you the tools to understand dynamic economic models

b. **Application:** Entry and Exit, Location Choices, Commitment, Hold-up

c. **Texts:** Chapter 8.7

d. Outline

i. Why dynamics?

ii. Sub-game Perfect Nash Equilibrium

iii. Applications

1. Pirate riddle
2. Commitment
3. Hotelling with location choice

e. **Recommended Problem Set:** Sequential tragedy of the commons, Stackelberg, Salop circle with entry (hard)

f. **Practice Problems from Text:** 8.3d-f, 15.7, 15.11e-f, 15.8

VIII. **Lecture 7:** Infinitely Repeated Games

a. **Main idea:** Give you the tools to understand dynamic economic models
b. **Application:** Dynamic Oligopoly/Cartels
c. **Texts:**
d. Outline
    i. Why dynamics?
    ii. Discounting and Infinite Sums
    iii. Applications
        1. Repeated Prisoner's Dilemma
        2. Tacit Collusion/Cartel
e. **Recommended Problem Set:** Repeated Bertrand and tacit collusion
f. **Practice Problems from Text:** 15.6 (hard)

IX. **Lecture 8:** Incomplete Information

a. Outline
    i. Types and incomplete information
    ii. Bayesian Nash Equilibrium
    iii. Example: Reddit and GameStop
    iv. Perfect Bayesian Nash Equilibrium
    v. Example: Predatory Pricing and Entry Deterrence
    vi. Main Example: Spence Signaling
b. **Texts:** Ch. 8.9-8.10 (general incomplete information), Ch. 8.11 (Spence, signaling), Ch. 15.9 (predatory pricing), 18.9.2 (market for lemons)
c. **Recommended Problem Set:** ebay quality signaling
d. **Practice Problems from Text:** 8.8 (note a hybrid equilibrium is where some types are mixed and others are not), 8.10 (hard), 15.12

X. **Lecture 9:** Asymmetric Information

a. **Texts:** Ch. 18.1 – 18.6, 18.8 (the other sections in this chapter might be helpful/interesting)
b. **Outline:**
    i. What is private/asymmetric information?
    ii. Hidden Action and Moral Hazard
        1. Ex: Manager and worker
    iii. Hidden Types and Adverse Selection
        1. Example: Wage bargaining
c. Hidden Types Practice Problems from Text: 18.1, 18.6, 18.7, 18.8 (you will not be tested on auctions)
d. Hidden Action Practice Problems from Text: 18.2**,** 18.5, 18.9
e. Recommended Problem Set: Moral hazard in insurance, adverse selection in insurance.
f. Note About This Lecture: This lecture and the associated problems are more challenging than the rest of the class.

XI. **Lecture 10: Understanding Obamacare and the Individual Mandate**

a. Not tested.
b. If you do not do the problem set from the last lecture it may be hard to follow this lecture.

c. Outline:

i. Lecture about connection between Obamacare and this class

ii. Open Discussion

iii. Final Questions/Discussion

XII. Lecture 11: Final Review Session

XIII. Lecture 12: Final

Note: This document outlines all the main components of the class. However, it is subject to change due to time constraints. It will be updated when possible.